

PERSONAL COMPUTING

JANUARY 1982
\$2.00

A Hayden Publication

Rapid reading of your market's response

Computers clobber
energy consumption

Down-to-earth astronomy

What's your
investment IQ?

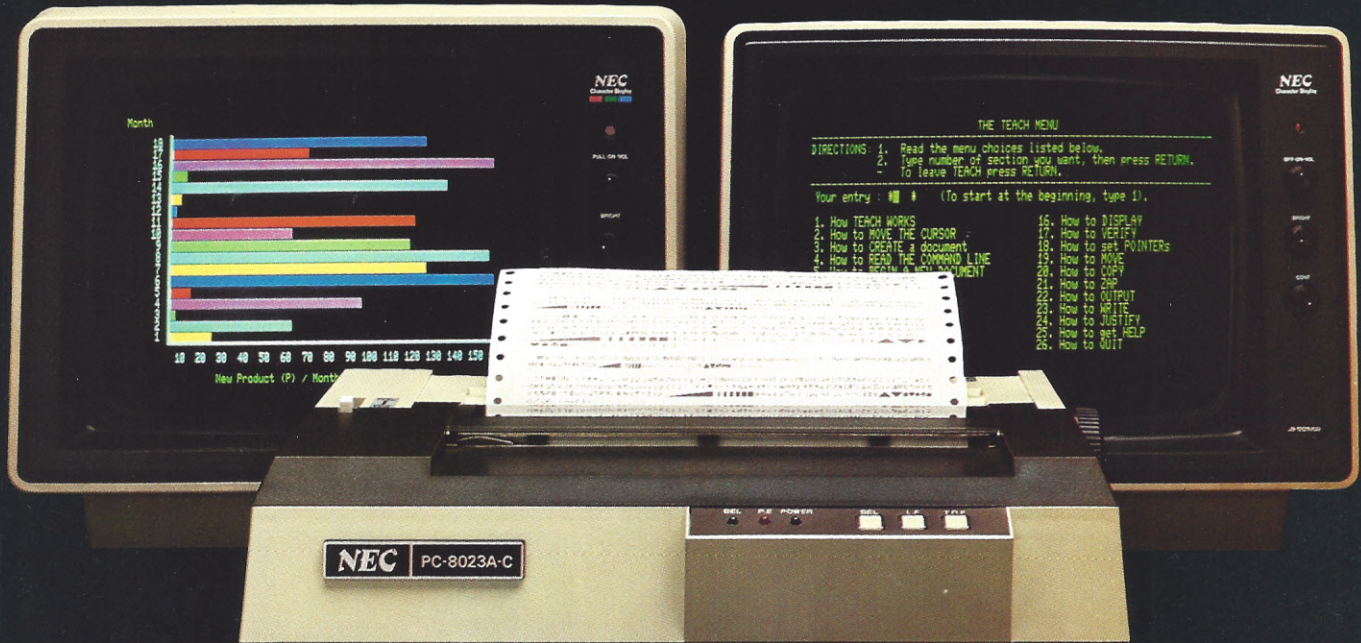
Inventory control
can work



Give your system some NEC, and watch its performance soar.

NEC's crisp, clear, high-performance JC1202 RGB color monitor, an industry standard. Also available: the JC1201 composite video version.

NEC's classic green monitor, (JB1201), one of microcomputing's performance legends. Easy on the eye, and the checkbook.

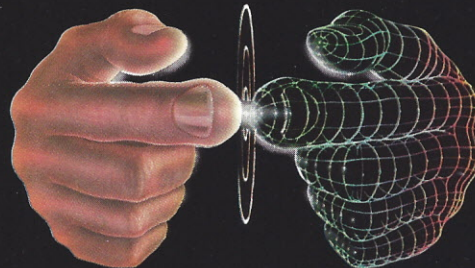


The impressive new NEC dot matrix printer. Parallel interface, 100 cps, 2K buffer, pin or friction feed. Stunning performance and versatility in the hottest new peripheral of the year.

You don't need an all-NEC system to benefit from NEC components.

Owners of Apple®, Radio Shack®, Atari®, IBM®, and many other microcomputers will find their equipment to be perfectly compatible with NEC's famous monitors, as well as our highly-featured new PC-8023A dot matrix printer.

Ask your dealer for a demonstration.



**Productivity
at your fingertips**

NEC

**NEC Home Electronics USA
Personal Computer Division**
1401 Estes Avenue
Elk Grove Village IL 60007

CIRCLE 1

DUAL RAM POWER RAMPLUS+

From Mountain Computer

Compatible with Apple® Language Card

16K RAM Provided

***Additional 16K RAM Chips Available,
utilized by user-generated software.***

No Chip to Pull

No Cables to Attach

Works in our Expansion Chassis™

***See your Apple® dealer or
contact us for information.***



Mountain Computer
INCORPORATED

300 El Pueblo

Scotts Valley, CA 95066

TWX: 910 598-4504

408 438-6650

Apple II is a trademark of Apple Computer Inc.

Ram Photo—Animals Animals Enterprises/©Marty Stouffer Productions

Mountain Photo—©Avery E. Dee

CIRCLE 2

PERSONAL COMPUTING

January 1982
Vol. VI No. 1

DEPARTMENTS

5 EDITORIAL

7 FEEDBACK

10 OUTLOOK

109 DEALER'S DIGEST

PRODUCTS

112 Hardware

Systems

Peripherals

Communications

Boards

131 Software

Business

Educational

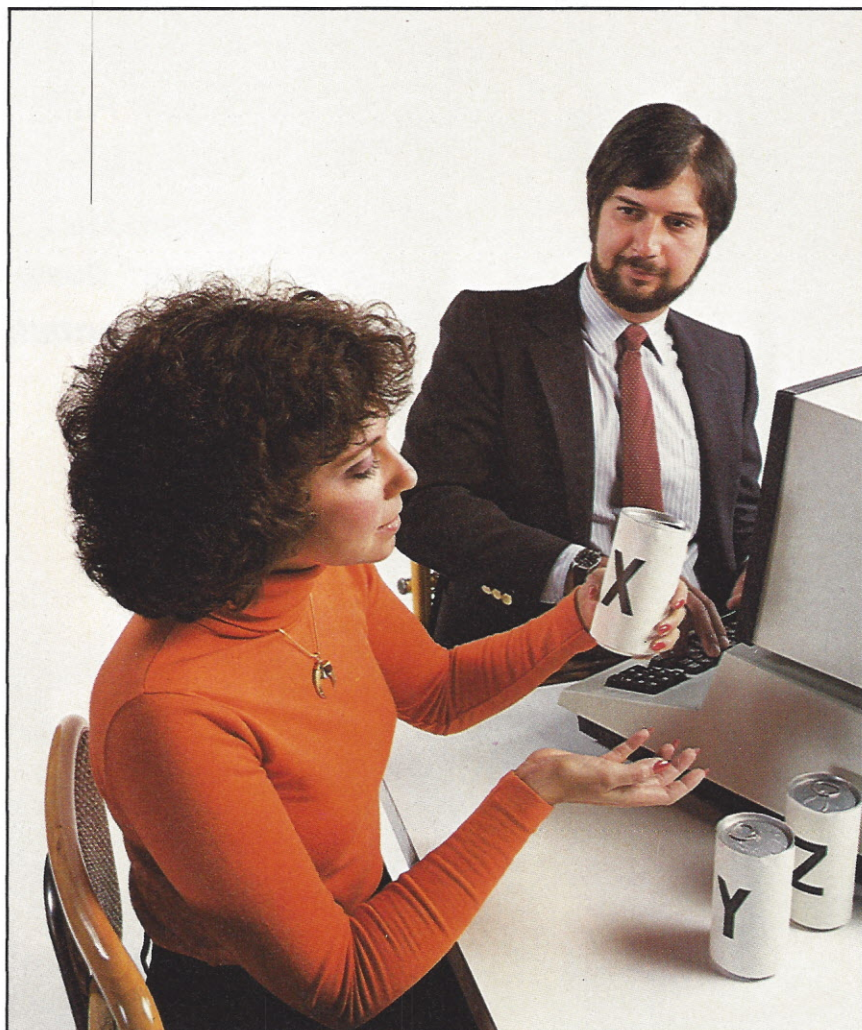
Utility

Leisure/Home

141 New Literature

**162 PERSONAL COMPUTING
DEALERS**

164 ADVERTISERS' INDEX



COVER PHOTO BY STEVE EISENBERG

Page 42

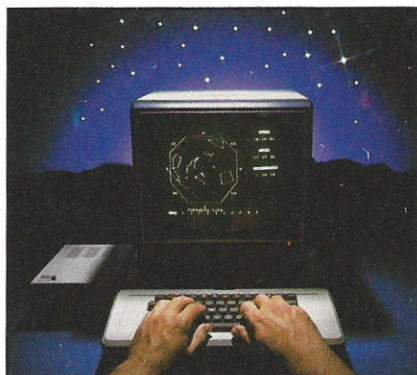
BEHIND THE COVER

The agony of translating market-research data into meaningful marketing information has been eased through the use of personal computers.

159,170 copies of this issue printed



Page 18



Page 33



Page 57

FEATURES

18 UP YOUR SPEED AND EFFICIENCY WITH COMPUTERIZED INVENTORY CONTROL

BY BETSY GILBERT You no longer need to lose time or effectiveness due to inventory problems. Why not let your personal computer tell you exactly what you need exactly when you need it?

27 TURNING TO PERSONAL COMPUTERS IN THE FACTORY OF THE FUTURE

BY JASON BIRMINGHAM While some managers are grappling with common manufacturing problems caused by miscalculations in inventory, labor costs and factory time, other managers have their terminals on and their feet up.

33 ARE THE STARS OUT TONIGHT?

BY HAROLD MILLER We all tend to forget the earth's insignificance in light of the vastness of the galaxies. Refresh your perceptions of who we are and where we are with this simple program that charts the universe.

38 INTELLIGENT INVESTMENT MANAGEMENT BY COMPUTER

BY PAUL RYAN Personal computers have become a tool of the Wall Street trade. But they're springing up in businesses and homes on Main Street too, as people are quickly finding out that these computer tools can stretch each investment dollar.

42 RAPID READING OF RESEARCH DATA

BY ALAN RADDING Anyone who goes to the trouble of extensive market study needs to be able to translate all that data into meaningful, useful marketing information. Personal computers are proving to be the perfect bridge across the raw data/marketing plan gap.

51 TEACH YOUR TRAINEES BY COMPUTER

BY DAVID GABEL Millions of dollars are spent annually on training employees. Now personal computers can find their way down corporate corridors, yielding maximum educational benefits and minimum investment expenditures.

57 HIGH-LEVEL LANGUAGES—WHICH IS FOR YOU?

BY ROBERT HARWOOD There is indeed a rational way to determine which programming language is for you, if you specifically know what to look for.

69 ENERGY ANALYSIS FOR EFFECTIVE CONSUMPTION

BY JASON BIRMINGHAM AND HAL GLATZER It used to be that \$1 filled a Buick gas tank and \$10 heated a five-bedroom home. Now that same Buick and that same home could bankrupt many a pocket. But there's no need to fret: Accurate analysis of your energy use can keep you warm and mobile.

76 MAILING-LIST PACKAGES—A MAINSTAY FOR BUSINESS

BY ROBERT PERRY Businesses that at one time could not afford mailing lists can now target their audiences with a minimal investment. Here's what's available, and from whom.

PERSONAL COMPUTING (ISSN 0192-5490) is published monthly by Hayden Publishing Company, Inc., 50 Essex St., Rochelle Park, NJ 07662. James S. Mulholland, Jr., President. Printed at World Color Press, Inc., Mt. Vernon, IL. Second class postage paid at Saddle Brook, NJ and at additional mailing offices. Copyright© 1981, Hayden Publishing Company, Inc. All rights reserved. POSTMASTER: Please send form 3579 to PERSONAL COMPUTING, P.O. Box 1408, Riverton, NJ 08077. Subscription rates: U.S. 1 year (12 issues) \$18; 2 years (24 issues) \$33; 3 years (36 issues) \$46. Canada & Mexico: add \$4/year for surface mail, \$8/year for airmail. Other countries: add \$8/year for surface mail, \$36/year for airmail. Back issues: U.S.: \$4. All other countries: \$5.

"My own IBM computer. Imagine that."

One nice thing about having your own IBM Personal Computer is that it's *yours*. For your business, your project, your department, your class, your family and, indeed, for yourself.

Of course, you might have thought owning a computer was too expensive. But now you can relax.

The IBM Personal Computer starts at less than \$1,600† for a system that, with the addition of one simple device, hooks up to your home TV and uses your audio cassette recorder.

You might also have thought running a computer was too difficult. But you can relax again.

IBM PERSONAL COMPUTER SPECIFICATIONS *ADVANCED FEATURES FOR PERSONAL COMPUTERS

User Memory 16K - 256K bytes*	Display Screen High-resolution (720h x 350v)* 80 characters x 25 lines Upper and lower case Green phosphor screen*	Color/Graphics <i>Text mode:</i> 16 colors* 256 characters and symbols in ROM* <i>Graphics mode:</i> 4-color resolution: 320h x 200v* Black & white resolution: 640h x 200v* Simultaneous graphics & text capability*
Permanent Memory (ROM) 40K bytes*	Diagnostics Power-on self testing* Parity checking*	Communications RS-232-C interface Asynchronous (start/stop) protocol Up to 9600 bits per second
Microprocessor High speed, 8088*	Languages BASIC, Pascal	
Auxiliary Memory 2 optional internal diskette drives, 5¼", 160K bytes per diskette	Printer Bidirectional* 80 characters/second 12 character styles, up to 132 characters/line* 9 x 9 character matrix*	
Keyboard 83 keys, 6 ft. cord attaches to system unit* 10 function keys* 12-key numeric pad Tactile feedback*		

Getting started is easier than you might think, because IBM has structured the learning process for you. Our literature is in *your* language, not in "computerese." Our software *involves* you, the system *interacts* with you as if it was made to—and it was.

That's why you can be running programs in just one day. Maybe even writing your *own* programs in a matter of weeks.

For ease of use, flexibility and performance, no other personal computer offers as many advanced capabilities. (See the box.)

But what makes the IBM Personal Computer a truly useful tool are software programs selected by IBM's Personal Computer Software Publishing Department. You can have programs in business, professional, word processing, computer language, personal and entertainment categories.

You can see the system and the software in action at any ComputerLand® store or Sears Business Systems Center. Or try it out at one of our IBM Product Centers. The IBM Data Processing Division will serve those customers who want to purchase in quantity.

Your IBM Personal Computer. Once you start working with it, you'll discover more than the answers and solutions you seek: you'll discover that getting there is half the fun. Imagine that.

IBM®

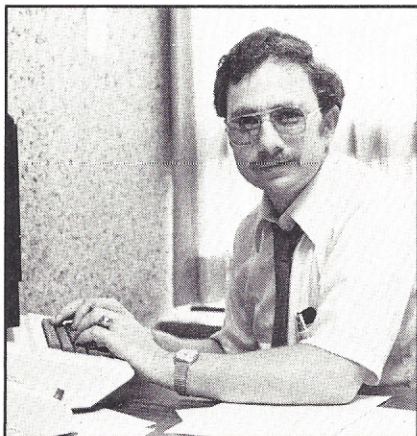
The IBM Personal Computer and me.



†This price applies to IBM Product Centers. Prices may vary at other stores.

For the IBM Personal Computer dealer nearest you, call (800) 447-4700. In Illinois, (800) 322-4400. In Alaska or Hawaii, (800) 447-0890.

Be it resolved



I can well remember New Year's when I was small. This was the time of year when everyone was making New Year's resolutions.

So, like everyone around me, I would pick several areas of my immediate concern and resolve to do a number of admirable things to improve those areas. I just as regularly never kept many of those resolutions—despite the fact that I really wanted to.

After a while, I decided the problem was that I made too many resolutions. I cut back, and found my resolve better for being undiluted. Thus I found I gave myself a much better chance of accomplishing the one thing that was most important at the time.

It's often like that in human endeavor. Programs that are too ambitious founder, while smaller, better defined and more pointed programs succeed. It seems that if we can keep our resolutions fixed on a single goal, then that goal is much more likely to be attained.

One goal that people in personal computing should fix their sights on in this new year is alleviating the problems with copyright law. This goal is so important that if we as personal-computer users don't find a

possible solution, we may find our lives seriously impaired because the use of our time- and money-saving computers may be restricted.

I'm not talking about copyright law in general. I'm referring to the way those laws are being applied to the video industry and how they could be applied, by extension, to the personal-computer industry.

Copyright laws are designed to protect authors and publishers from the theft of their property. Traditionally, that property has been books, magazines, newspapers or written music, and the law governing this property was fairly easy to enforce. Only large organizations with lots of machinery could copy (and steal) anything written in large volume.

Then along came the office copier. Enforcement became more difficult because anyone who worked in an office with a copy machine could duplicate anything printed. Then along came the personal computer and other electro c marvels, and enforcement became practically impossible.

Anyone with a personal computer can copy the software that will make the computer work. To be sure, there are protection schemes that make the copying difficult. But any protection scheme invented by humans can be defeated by humans. The software that was thus "protected"—someone's work, creativity, genius—is open to out-and-out theft.

Make no mistake about it. Copying a program (for other than archival-backup purposes with the publisher's consent) is theft. It's a violation of copyright law. Software authors and publishers think it should be stopped. But how?

The courts have recently taken up

that question in the home-video field. And the latest ruling on the question of copyright infringement (theft by copying over-the-air television broadcasts for replay) is that such actions are illegal. But, probably realizing the impossibility of enforcing the law, the court says the manufacturers of the recording equipment are responsible for law violations that stem from such use of videocassette recorders. The case is being appealed.

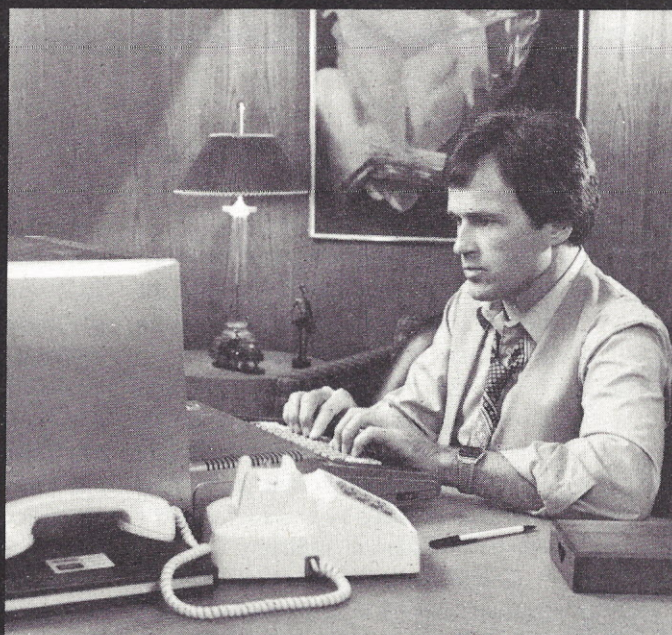
Besides the fact that the ruling uses the same logic as would locking up Messrs. Smith & Wesson because a spouse is shot in a marital quarrel, it clearly can't be applied to personal computing. Should manufacturers be held liable because their products perform their intended purpose, one part of which can be performed unlawfully? We think not.

What should be done? It seems clear that a change is needed in copyright law so it can deal with technology. We won't take sides on what the law should say, but it seems that the law just can't cope with modern life.

Let's set a goal and make a resolution to get a sensible change in copyright laws that can handle everyday technology. If you're in the industry, work within your firm to that end. If you're not, write to your national legislators to get the law changed, before manufacturers do something we don't want, just to protect themselves.

In the meantime, don't be a thief. Get your software legally, through authorized sources. Good software is really worth the price you pay for it. Your computer is useless without it.

David Gabel



Jason McDonald has a competitive edge on the market, right in his own home.

You can have all the financial information you could only get from your broker, right on your home TV screen. How? With a low cost terminal or microcomputer and CompuServe's **financial services**.

We have a data base that is now serving thousands of customers throughout the United States with the very latest information on stocks, commodities, bonds and most of the name business and financial publication sources required to keep abreast of today's competitive markets.

Just look at the financial information that's available through the CompuServe Information Service network. At home. On your TV screen.

MicroQuote: current and historical data on more than 40,000+ stocks, bonds and options. Includes volumes, dividends, earnings per share, ratings and shares outstanding. The information is updated daily.

Commodity News Service: pricing, news and commentary on energy, metals, financial instruments and agricultural commodities. Also weather, agricultural and economic news.

Standard & Poor's General Information File: selected items of information from S&P's NYSE, ASE, and OTC Stock Reports on over 3,000 corporations.

Financial pages of major regional newspapers: electronic editions of major daily newspapers including The Washington Post, The New York Times, The San Francisco Chronicle, plus the AP financial wire.

Raylux Financial Advisory Service: business outlook, financial commentary, stock market outlook, securities glossary and industrial outlook model.

Value Line Data Base II: CompuServe provides access to fundamental financial information on more than 1,700 public companies.

Fintol: personal financial programs.

How much does it cost?

The basic charge is \$5.00 an hour from 6 PM to 5 AM local time weekdays, and all day weekends—billed in minutes to your

charge card. MicroQuote, Standard & Poor's and Value Line are extra cost options. You can access the CompuServe Information Service with a local phone hook-up from more than 260 U.S. cities. For hardware you need a terminal or personal computer and a modem.

There's more.

Along with the financial services, you get all the rest of the CompuServe Information Services: AP news and sports wires, electronic editions of major daily newspapers, games, electronic encyclopedia, government publication data, travel information, valuable consumer and home-related information, entertainment features, electronic mail, nationwide bulletin board, newsletters from computer manufacturers—and more!

When your broker's not available, we are. CompuServe's Information Service can give you a competitive edge. Get a demonstration of the CompuServe Information Service at a Radio Shack® Computer Center or many Radio Shack® Outlets. Or for more information write "Financial Information" at the address below.

CompuServe

Information Service Division
5000 Arlington Centre Blvd.
Columbus, Ohio 43220
(614) 457-8600

Radio Shack is a trademark
of Tandy Corporation.

Editor
David Gabel

Managing Editor
Susan Foster

Assistant Editor
Elli Holman

Field Editor
Lee The'

Copy Editor
Cecilia Wessner

Editorial Assistant
Dorie MacDonald

Art Director
Tom Gilman

Production Manager
Vince Cicenja

Circulation Director
Barbara Freundlich

Subscription Manager
Robert Paratore

Reader Service
Paula Greenleaf

Manager of Dealer Service/Reprints
Maxine Sassano

Associate Publisher
Jeff Weiner

Publisher
Robert J. Lydon

For Subscriber Change of Address: Fill out coupon in this issue. Attach old mailing label, or write in your subscriber ID# which appears above your name. Fill in new address information and send to Personal Computing, P.O. Box 1408, River-ton, NJ 08077. Allow 6-8 weeks for address change to become effective.

Back Issues of Personal Computing are available on microfilm, microfiche, 16mm or 35mm roll film. They can be ordered from Serials Processing Dept., University Microfilms International, 300 North Zeeb Rd., Ann Arbor, MI 48106. For immediate information, call (313) 761-7400

Hayden Publishing Co., Inc., publishes Electronic Design • Computer Decisions • MicroWaves • Personal Computing • Electronic Design's Gold Book • MicroWaves' Product Data Directory • Hayden Books • Hayden Software

Audited Paid Circulation



FEEDBACK

Educational enlightenment

Dear Editor:

I have just put down your September 1981 issue and found that the story on educational computing by Lee The' has remained in my thoughts. The article was enlightening and has left me with a desire to learn more about this aspect of small computer use.

Having access to a personal computer and looking for productive ways to engage my talents, I feel that programming for educational purposes would be a worthwhile endeavor. If you could provide me with information on organizations knowledgeable in this area, I would be most appreciative.

Martin G. Chaney
Meridian, ID

Editor's note: There are indeed quite a few sources of information on educational computing. One such organization is the Minnesota Educational Computing Consortium (MECC), 2520 Broadway Dr., St. Paul, MN 55113. We also suggest that you contact your local or regional school district for more information.

Needs help

Dear Editor:

A little over a year ago I purchased my first TRS-80 Model I, Level II. Six months ago I increased the capacity to 64k and added a modem. It wasn't long before I found the programs I was using or writing were quite long and time consuming.

Unfortunately I live in an area where the nearest computer center is

well over an hour's drive away. After reading your article on disk drives there was no question that this was my next add-on. I must admit however, that I am at somewhat of a disadvantage and have several unanswered questions.

Any assistance you can give in getting me on the right track would be appreciated.

Ralph Paul
Bemus Point, NY

Editor's note: Help is on the way. The February 1982 issue of Personal Computing will feature a special report on mass-storage systems. The article will detail the different tapes, floppy disks and rigid disks available on the market. Buzz words will be explained, specifying hints, and the article will include a special buyers' guide.

Newsletter info

Dear Editor:

I just subscribed to *Personal Computing* and received my first issue the other day. In it I noticed that you mentioned the medical newsletter put out by Charles Mann and Associates.

I would like you to know that we, too, publish a newsletter for physicians. It's called *ComputerTalk for the Physician* with a focus on offering practical advice and informative editorial for the first-time buyer. The annual subscription rate is \$39. We publish monthly.

We also publish a sister publication for pharmacists.

William A. Lockwood
Publisher
ComputerTalk
1750 Walton Rd.
Blue Bell, PA 19422

Translation please

Dear Editor:

With respect to your article "A Computerized Cookbook; Help for the Gourmet," (November 1981), do you have plans to publish this for the Apple II? I'm not capable of making such a translation at this point.

Robert E. Daily
Alma, MI

Editor's Note: At this time we have no plans to publish a translation of this program. Your local computer dealer could be of some assistance in this matter.

Home uses

Dear Editor:

I appreciated your article "Put yourself in control with personal computing," (December 1981). However, I think it may have been limited in scope as to home uses of personal computers.

These machines are not only watering lawns. Their presence is felt in every room of the house. If you're in the kitchen, the personal computer can be helping you stay on your diet. If you're looking in the bathroom medicine cabinet, your computer can make sure that you are not taking a drug that is contraindicated by another drug. If you're in the kid's room or home office, the myriad of uses is almost limitless.

What I want to know is this: Do you plan to publish other ways in which I can use my personal computer? This was the first issue I received, and I'd like to know that I can expect more.

John Ansel
Richmond, VA

Editor's note: Fear not, John.

Each issue of Personal Computing is planned to help you in your quest for more information on how to use your personal computer. If you get a chance to look at some of our back issues, you'll see what we mean.

Radiation revisited

Dear Editor:

Following your May 1981 article on CRT radiation dosage (Are Computers Hazardous to Your Child's Health?), you printed a letter from Alois Treindl of Zurich (Feedback, September 1981) pointing out that radiation from a plane such as the face of a CRT is actually 16 times the amount used in your article.

Your author and Mr. Treindl are 1500 percent apart on estimates of real radiation dosage from CRTs. Since the theory that radiation is higher from a plane than from a point raises some questions not dealt with in your article, let me know if your advisors agree or disagree with Mr. Treindl's figures.

Richard Scott
Fairbanks, AK

Editor's note: According to our experts, planar radiation is much more intense than point-source radiation, other things being equal. But with CRTs, other things aren't equal.

The planar radiation emitted by the face of the CRT is secondary emission that is so low that it is almost unmeasurable—below the general background radiation of the earth's surface. The real radiation in a monitor or TV set is generated by the high-voltage power supply and the shunt regulator. This was a problem many years ago when this equipment was inadequately shielded by some manufacturers.

Now the shielding is built into the tubes themselves, along with metal

cages around the emission areas. The electron-beam gun at the back of the CRT is another potential source of much lower intensity. An increase in the lead content of the tubes eliminated both that and the planar radiation of the phosphor coating on the inside face of the CRT. So our author was right in her estimates, and planar radiation in this context is only of theoretic concern.

Always improving

Dear Editor:

Regarding my article, "Compress That Program" (July 1981), I have found a better way!

Lines 55320 to 55350 of "Despace" spend a lot of time resetting the line pointers. Several months after writing this article it occurred to me that the ROM resets these pointers, almost instantly, whenever you add, delete or edit a line in any program.

By making use of this ROM routine you can eliminate three lines of Despace and increase the execution speed significantly.

The following changes are required: In line 55315, change $V=X$ to $V=X/3$. Also, delete lines 55320, 55330 and 55350.

After loading your main program, make a note of its first line number. Then append and run Despace as described in the article. When it's finished, type: EDIT (the first line of your main program). Hit enter twice, once to enter the EDIT mode and once to escape. When you escape, the ROM will assume you've changed the program and will reset all the line pointers.

Now do the two pokes and the "CLEAR 50" requested by line 55500 and the job is done.

D. Wood
Winnipeg, Manitoba

FRIENDLINESS.

Informative HP manuals, helpful error messages, and automatic syntax checking make BASIC language programming easy.

FULL-SCREEN EDITING.

Edit the easy way – without retyping entire statements. Insert, change, or delete characters at the touch of a key.

INTEGRATED GRAPHICS.

Analyze a better way – with graphics. Document your results with hard-copy plots.

EXPANDABILITY.

Just plug in the HP interface bus (HP-IB) and add up to 14 peripherals without disassembly.

HP SOFTWARE.

Powerful, time-saving solutions to your everyday problems.

12-DIGIT ACCURACY.

(Not just 9!) Thanks to BCD math capability.

PORTABILITY.

Keyboard, CRT, printer and storage – all in a 20-lb. package. So you'll have computing power wherever you need it... office, lab, field, or home.



Hewlett-Packard put it all together.

The HP-85 personal computing system.

Leave it to Hewlett-Packard to put a lot of power in a little package. Plus flexibility, portability, and all the other features you'd expect to find in a personal, professional, integrated computing system.

Turn it on and the HP-85 is ready to go. You're off and running using HP software or creating your own programming solutions. There's no bootstrapping. And since the operating system and powerful BASIC language exist in ROM, they use almost none of the available RAM.

If you've been looking for a friendly, integrated

computer with power and dependability, look at the HP-85.

We put it all together for you!

For further information, phone toll-free, 800-547-3400, Dept. 289 A, except Alaska/Hawaii. In Oregon, call 758-1010. Or, write Hewlett-Packard, Corvallis, OR 97330, Dept. 289 A.

611/22

When performance must be measured by results.



HEWLETT PACKARD

CIRCLE 5

Healthy competition with Japan

Particularly in the electronics industry, Japanese competition is going to spur U.S. business on to an even stronger leadership position in the future, according to Ed Spencer, chairman of Honeywell and a member of the eight-man Japan-United States Economic Relations Group.

"Government and industry together must recognize the responsibilities that go along with open and free international trade and investment," Spencer said. "International competition between our industries is a healthy thing. Of course we have to be understanding of each other's national interests and domestic political problems. That is possible while maintaining the industrial strength toward which competition contributes. The consumers in Japan and the United States will be the beneficiaries."

Library seeks program descriptions

The Gutman Library at the Harvard University is seeking program descriptions for inclusion in its forthcoming second edition of *Microcomputer Directory: Applications in Educational Settings*, which will be published this spring.

Anyone involved in a project who uses personal computers for instructional and/or administrative purposes should contact: *Microcomputer Directory*, Gutman Library, Harvard University, Graduate School of Education, Appian Way, Cambridge, MA 02138.

Computers in education conference

The Second Annual Southern California Computers-in-Education Conference is scheduled for May 14-15, 1982 at University High School, Irvine, Calif. The conference will cover applications of computers in education, from kindergarten through two-year college. The sponsor is Computer-Using Educators.

The focus of the conference will be the use of computers in the school setting. All areas of the curriculum will be covered with emphasis on helping teachers get started using personal computers in the classroom. A free software exchange will make many programs available. Hands-on workshops and field trips are also planned.

Speakers are needed for the program. March 15, 1982 is the deadline for prospective speakers to make arrangements to come to the conference.

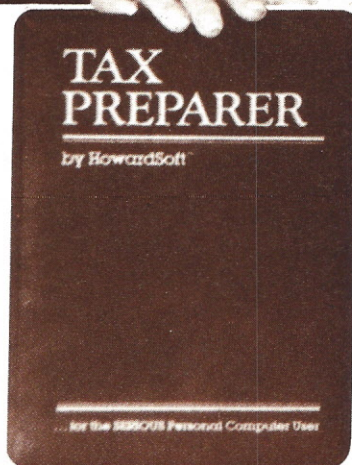
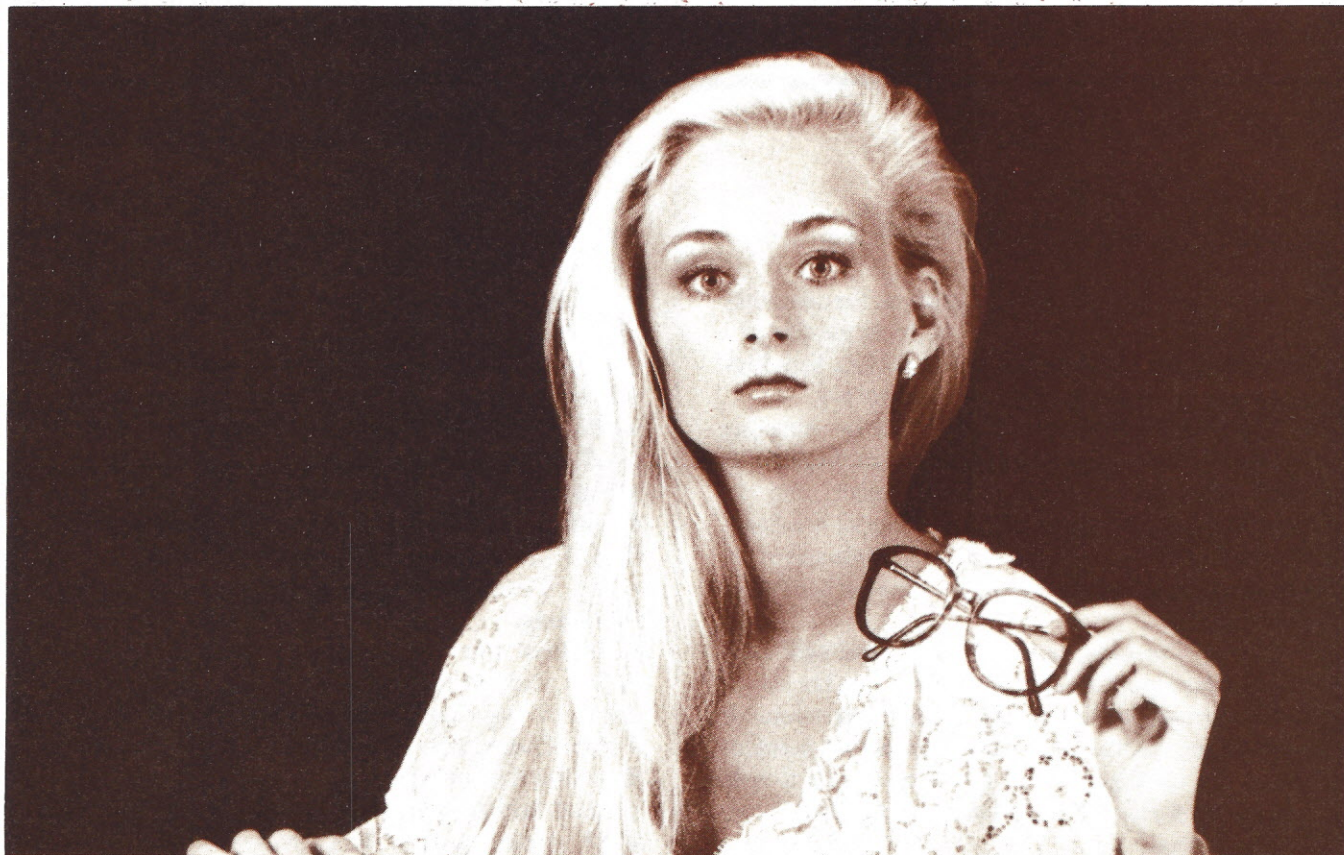
Further information can be obtained from Craig Walker, Arrowview Intermediate School, 2299 North "G" St., San Bernardino, CA 92405; (714) 886-9118.

Computer personnel demand up

Employer requests for computer personnel during the first nine months of 1981 were up 23 percent over the same period last year, reports Robert Half International, the world's largest data-processing recruiters.

Robert Half, who heads the organization, attributed the sharp rise in demand for data processors to three major factors: First, in this period of severe inflation, high interest rates and growing competitive pressures, businesses must generate, retrieve and analyze more information more quickly than ever before.

Secondly, the new inexpensive mini and personal computers are enabling smaller firms to realize the benefits of on-premises data-processing facilities for the first time. And thirdly, additional data processors are needed to maintain and upgrade existing systems, and to operate newer, more sophisticated hardware.



YOU ASKED FOR IT!

The 1982 Edition of **TAX PREPARER** by HowardSoft

You made us #1 in tax software last year. You spread the word when we were new and unknown to your local dealer. Now we're repaying you by adding all the new features you requested in your helpful letters of encouragement. With our new software and an Apple Computer you can prepare error-free returns in minutes rather than hours and maintain records for next year too.

On-screen facsimiles — no new data entry methods to learn; enter raw data on forms & let computer perform all the math.

Auto-updating — changes in one form reflected in all others for immediate error correction.

Tax book-keeping — long itemized lists accommodated with numbers easily changed from month to month or year to year.

Tax planning — rapid estimates of tax bite without laborious completion of all forms.

Complete set of forms — 22 forms & schedules including min. & max. taxes, income averaging, capital gains, depreciation, farm, rentals, & more.

Up-to-date — includes the new 1981 forms and automatic calculation of the new ACRS depreciation schedules; and low-cost annual updates keep you current.

Error-free computing — tested all year by hundreds of tax professionals.

Fully error tolerant — trouble free operation for the computer novice.

Prints on preprinted 1040s — continuous form (batch for all clients) and single sheet operating modes.

Prints IRS-accepted facsimiles — improved formats for multi-client printing and trouble-free filing with the IRS.

Companion state packages — separately priced add-on for selected states uses federal data as starting point; no need to re-enter data.

Extensive instructions — manual greatly expanded and rewritten for clear guidance through the web of IRS forms and schedules.

AT YOUR LOCAL DEALER.



Howard Software Services

... for the SERIOUS Personal Computer User

8008 Girard / Suite 310 / La Jolla, CA 92037 / (714) 454-5079

\$150 FOR BASIC FEDERAL PACKAGE.

\$ 75 FOR SELECTED STATE PACKAGE.

What else?...Creative Financing & Real Estate Analyzer.

A brave new computer world

In a short technological generation, the computer has shrunk from bigger than a room to the size of a breadbox. It then shrunk to smaller than a breadbox and now it's the size of a cracker-jack box.

The latest epoch in the history of the amazing shrinking machine has apparently just begun. A new Panasonic (Matsushita) computer, only 14 pounds and able to be held in the palm of one hand, has tossed down another gauntlet and ushered in yet another era in high technology's "small is beautiful" fixation.

Called The Link, or an HHC for hand-held computer, Panasonic officials emphasize that the device is not merely an upgrading of the programmable calculator. Rather, it's a true computing machine with the intelligence and power to handle a wide range of processing and telecommunications functions by itself.

"This is the first of a new generation of computers," says Bill Kopp, Panasonic merchandise manager, "because it is a state-of-the-art advance as significant as the development of the mainframe, mini and desktop computers. The HHC generation promises to make the computer as ubiquitous as the portable radio and calculator, but far more socially and economically influential."

The Link operates with an internal RAM memory of 4 kbytes, small by most personal computer standards, but this can be expanded by adding external RAM modules of 4 or 8 kbytes each. The internal ROM memory is 48k maximum, using three 16 kbyte program capsules.

But it is in the area of available peripheral components that distinguishes this computer from any of the other hand-held machines, which Panasonic considers to be only gilded calculators. For about \$2100 the system also includes a bus expander through which up to six other modules can be connected, a portable thermal printer, a programmable memory, a telecomputing system and a color television connector. These peripherals can be hooked up and then hauled in an attache case-like carrier to bring the office out into the field.

This is how Panasonic officials envision its use. According to these officials, the HHC is both a way of carrying office data anywhere it needs to be taken, and is an umbilical cord to the central office. This is accomplished mainly through an informa-

tion exchange over telephone wires via the computer's telecomputing modem.

Applying the HHC at outside locations, its uses are clearly varied. Salesmen can enter orders, prepare bids and make presentations; service personnel can order parts, update inventories, record calls and file bills; technicians can analyze problems and test equipment; distribution fleets can enter pickup and delivery data; and traveling executives can electronically post memos and receive messages.

All of this is accomplished by an array of programs developed for The Link by Panasonic, with Friends Amis, Inc., a San Francisco-based software firm. Titles include Field Computing, Mobile Medicine, Field Auditing and Portable Word Processing.

At least one high-technology consulting firm agrees with Panasonic's assessment that a new world of tiny hand-held computers is evolving. Future Computing, Inc., of Richardson, Texas, predicts that the worldwide annual growth in units sold of hand-held machines will be 103 percent through 1985, compared to a 30 percent yearly sales increase for the desktop personal computers. Future Computing expects that in 1985, 2.5 million HHCs will be sold, while 1.7 million desktop personal machines will change hands that year. These figures are again worldwide.

Other analysts are less optimistic, but are no less impressed. Although they assert that the personal computer will not be surpassed in the market by its smaller kin, they agree that the hand-held machine is a bold step forward in making computing devices a comfortable fixture in all segments of society.

An Apple for the family

Apple Computer has introduced a personal-computer system designed to meet the needs of the entire family. Called the Apple Family System, the unit combines its easy-to-use personal computer, software and manuals into a package geared for the first-time computer user.

"Apple has designed a system which is home oriented and provides meaningful applications for every member of the family—from the preschooler on up," states Michael Connor, marketing manager for the Apple II.

"This is a system that eases the first-time user's fear of computers. It is based on 'friendly' hardware

Before you buy any printer, give it this test.

	Other IMP-4		
GREAT GRAPHICS	☐	☒	Only IMP-4 gives you bi-directional printing of dot addressable graphics at no extra cost. And with our Quad Density feature, you can even print 19008 dots per square inch! That's more than twice the resolution of Epson's finest!
SIMPLE PLUG-IN	☐	☒	Apple, TRS-80, PET, Atari, HP... you name it. We've got the industry's widest range of interfaces ready to plug into your computer.
3-WAY PAPER HANDLING	☐	☒	Axiom's IMP-4 lets you use single sheets, roll paper, or continuous tractor-fed forms. On other printers these features are probably expensive options, if available at all.
LIFETIME 9-WIRE PRINT HEAD	☐	☒	Axiom's rugged head prints good looking tightly formed characters with lower-case descenders, 6 different character sizes and boldfaces too, all printed bi-directionally at up to 100 cps!
MODERN STYLING	☐	☒	Styling isn't the main reason you choose a printer, but isn't it nice to know you're getting a printer that will also look great in your office or home?
Score 2 points for each answer.		10	

AXIOM's new IMP-4 scores a "10."

IMP-4 printer shown with optional sound shield.



AXIOM

AXIOM CORPORATION

1014 Griswold Avenue, San Fernando, CA 91340 • Telephone: (213) 365-9521 • TWX: 910-496-1746

CIRCLE 7

Stop Playing Games And Get Down To Business

Corvus Transforms the Personal Computer into a Powerful Business Tool.

In business, professional offices, and schools throughout the world, thousands of Corvus intelligent peripherals bring mass storage, increased speed, and multi-user capability to a variety of microcomputers. Current applications include accounts receivable and payable, medical records, mailing lists, inventories, word processing, insurance, mathematics and science, and other large and complex files.

Corvus proven Winchester disk technology provides 10 to 80 million bytes of capacity, fully compatible with your current operating system. This is up to 500 times the capacity of a floppy disk.

The Corvus CONSTELLATION links up to 64 computers in a state-of-the-art multi-processor network. It provides shared mass storage, pipes for inter-computer communication, and system spooling for sharing of peripherals such as printers. Performance far exceeds that of larger and more expensive networks.

Backup data protection and archival storage are provided by the Corvus MIRROR (Patent Pending), a low-cost backup using standard video cassette recorders.

Contact your local Corvus dealer for the full story about these innovative new products.

★ ★ **CORVUS SYSTEMS**
★ 2029 O'Toole Avenue
★ San Jose, California 95131
(408) 946-7700/TWX 910-338-0226



and software and is equipped with clear, easy-to-understand instruction manuals. Even the individual who has never used a computer before will have the system operating in an hour."

Many of the system's applications involve aiding the family in the business of running a home, including personal finance, home budgeting, investment management, information management, record keeping, letter writing and address-file organization. The package also includes an array of skill-building, strategic games and can be used for educational purposes at levels from reading, typing and elementary math, to writing term papers.



The entire family will find uses for the new personal-computer system packaged by Apple Computer.

The Family System consists of the Apple II Plus computer, a disk drive with controller card, hand controllers and a modulator. It includes a new keyboard tutorial, a program that acquaints users with the computer and its use; an owner's guide, an introduction to the computer which guides the owner from unpacking the computer to running it; an educational software directory, allowing users to identify software that will meet their family's educational needs; seven software programs and the complete library of understandable, easy-to-use Apple II manuals.

The software includes AppleWriter, a text-editing program that can be used for writing letters, poems, novels or messages. The Personal Filing System is an organizer: It keeps files, address books, Christmas-card lists, recipe boxes and other information which clutters the house. The program enables information updates and is especially handy for home-run businesses—from paper routes to mail-order operations.

The Personal Finance Manager program helps the family track budgets, credit standings, taxes and personal investments. Both the Personal

Finance Manager and Personal Filing System help in the running of volunteer organizations—keeping personnel activity files, calendars and budgets.

The Typing Tutor program teaches touch typing. The other programs in the Family System—Apple Adventure, Olympic Decathlon and Apple Invaders—are strategic games for family or party entertainment.

As the family members become more familiar with their Apple, they may want to explore other applications such as business or school homework, tracking stock-market investments, learning a foreign language, developing colorful three-dimensional designs or practicing spelling. To help the family choose the additional software to best suit its needs, the Family System owner's guide and education software directory includes "growth path" suggestions.

The price is \$2495.

Sears chooses Okidatas

Sears, Roebuck and Co. has contracted with Okidata to sell and service Okidata's Microline printers through Sears' new Business Systems Centers.

Okidata's Microline series of dot-matrix printers offers small systems and personal-computer users high-performance and low-cost printing capabilities. The printers feature a stored-energy matrix print head with a full year's warranty and print from 80 to 200 characters per second. The Sears Business Systems Centers will sell the Microline models 80, 83A and 84, and will provide customer training as well as service.

Says John M. Purtell, Jr., national manager of Sears Business Systems Centers, "We chose Okidata's Microline printers because they meet the criteria we have established for our merchandise for quality and for price/value relationships, and we believe they will fulfill the needs and expectations of our customers. Sears Business Systems Centers will make a complete line of quality brand-name products available to small businesses and business professionals."

The first five Sears Business Systems Centers recently opened in Boston, Chicago and Dallas on a test basis, says Purtell. "We are optimistic about the potential of this marketplace. Our hope is ulti-

mately to have a national network of such centers."

In addition of Okidata printers, Sears Business Systems Centers will carry the new IBM Personal Computers, as well as systems and business equipment from Wang, NEC, Hewlett-Packard, Vector, Texas Instruments, Exxon, Saxon, Panasonic and Hitachi.

Center aids problem juveniles

Problem students at the Creative Rapid Learning Center in Austin, Texas, are learning marketable skills with the help of their Radio Shack TRS-80 computer equipment.

The learning center is a pilot program conducted by The American Institute on Learning Differences and Juvenile Behavior in conjunction with Laguna Gloria Art Museum and the University of Texas YM/YWCA. It is a non-profit community-service organization dedicated to helping out-of-school youths between the ages of 11 and 18, and is being studied as a model program for its work with juvenile delinquents.

Charles Phillips, a Radio Shack senior vice-



president, reports, "We have been involved in a test to bring literacy and education to problem juveniles in the Austin area. Most kids are referred to this group by the courts and the Austin Independent School District. The group operates on the simple theory that if these kids can be educated they will find their way into the marketplace as productive citizens rather than potential problems.

"The cost of incarceration for an individual has been estimated at more than \$20,000 a year. That's

an impressive number to compare with a tax-paying citizen—which is the program's objective."

One of the first people to see the results of the program early in 1980 was then Juvenile Public Defender Cynthia Bryant. She comments, "The learning center has taken my 'worst' clients and has never failed with any of them...kids who were considered seriously disturbed and emotionally hopeless. Those same kids became happy...and they became educated."

Future plans at the center include using the personal-computer system to teach basic reading and mathematical skills, to help build self-esteem, and to evaluate and analyze the energy-saving value of various devices in a YMCA and U.S. Department of Labor sponsored "Energy Brigade" project.

The center currently uses eight TRS-80 systems.

First turtle learning center

The first Turtle Learning Center, organized to provide young people with an on-going opportunity to enjoy learning about personal computers and computer languages, has been opened in Richardson, Texas. Organized and operated by the Young Peoples' LOGO Association, the Turtle Learning Center will offer on-going individualized instruction in LOGO, turtle graphics, BASIC, Pilot and other languages appropriate for young people.

"Too often computer courses for young people run far too short a time and don't give youngsters the chance to really get into what personal computing is all about," states Jim Muller, YPLA president. "Our Turtle Learning Centers are going to change that."

For a monthly membership fee, youngsters will be able to spend a Saturday afternoon learning about LOGO and other computer languages. They will also gain experience with different peripherals, networking, telecommunications and the pure fun of a computer—from what makes the single-chip personal computers used in electronic toys tick to what personal computers can do for them.

"We're starting in a garage with about a dozen systems and about two dozen youngsters," says Muller. "Our plans call for the eventual opening of

continued on page 102



The Manager Series* from Microsoft™ turns a personal computer into an executive toolbox.

Better management tools. The Manager Series from Microsoft turns an inexpensive personal computer into an executive's toolbox. Not a computer programmer's toolbox. An executive toolbox. Computerized management tools for non-computer people.

Time, people, projects. The Series is a system of software tools that work together to help you plan, organize, schedule and record your business and personal affairs. Time Manager,* Project Manager* and Personnel Manager* are the first packages in the Series.

Write it once. All programs in the Manager Series allow you to transfer information between programs. That means you can enter information in one program and transfer it for management by another.

Time Manager. The key. Time Manager helps you manage your personal time, appointments and priorities. It can also help you manage expenses, costs and job schedules. Or, keep a running tally of costs and hours by day, week, month or year. And Time Manager can act as an "executive" to manage other programs in the Series.

Project Manager. Describe the components of a project to Project Manager. It will create timing, task and resource charts to help you focus on critical tasks. Change one piece of information and Project Manager will



recalculate the entire project. Project Manager even flags overcommitted personnel resources.

Personnel Manager. Manage information about people, companies, customers or prospects. From names and addresses to skills, position, and characteristics. Personnel Manager lets you enter any kind of people-related information. Then, organize and retrieve it almost any way you want.

Management software. Even if you've never used a computer before, you should be able to productively use the Manager Series in a very short time.

And, when you've learned to use one in the Series, you've virtually learned them all.

Seeing is believing. Ask your local computer store for a demonstration of the Manager Series. It's a series of management tools that could be your best reason to own a personal computer.

*Trademarks of The Image Producers, Inc.

MICROSOFT

CONSUMER PRODUCTS

A Division of Microsoft, Inc.
10700 Northup Way • Bellevue, WA 98004

BUSINESS COMPUTING

Up your speed and efficiency with computerized inventory control

Sophisticated inventory-control software helps businessmen keep track

The cat is out of the bag. Despite what minicomputer manufacturers say to the contrary, it's an undeniable fact that the personal computer has grown up, and is steadily moving in on territory that the mini once claimed as exclusive.

With the recent introduction of sophisticated inventory-control software to the personal-computer market, great strides are being made in the business world.

"Personal-computer users have wanted to use their systems in inventory-control applications for some time, but the software just wasn't there," says James Harrison of SofTech International, creators of the STOCK FILE package for the Apple II.

According to Harrison, the inventory packages that have been marketed over the past couple of years simply haven't been able to offer users what they needed.

"The software that's on the market



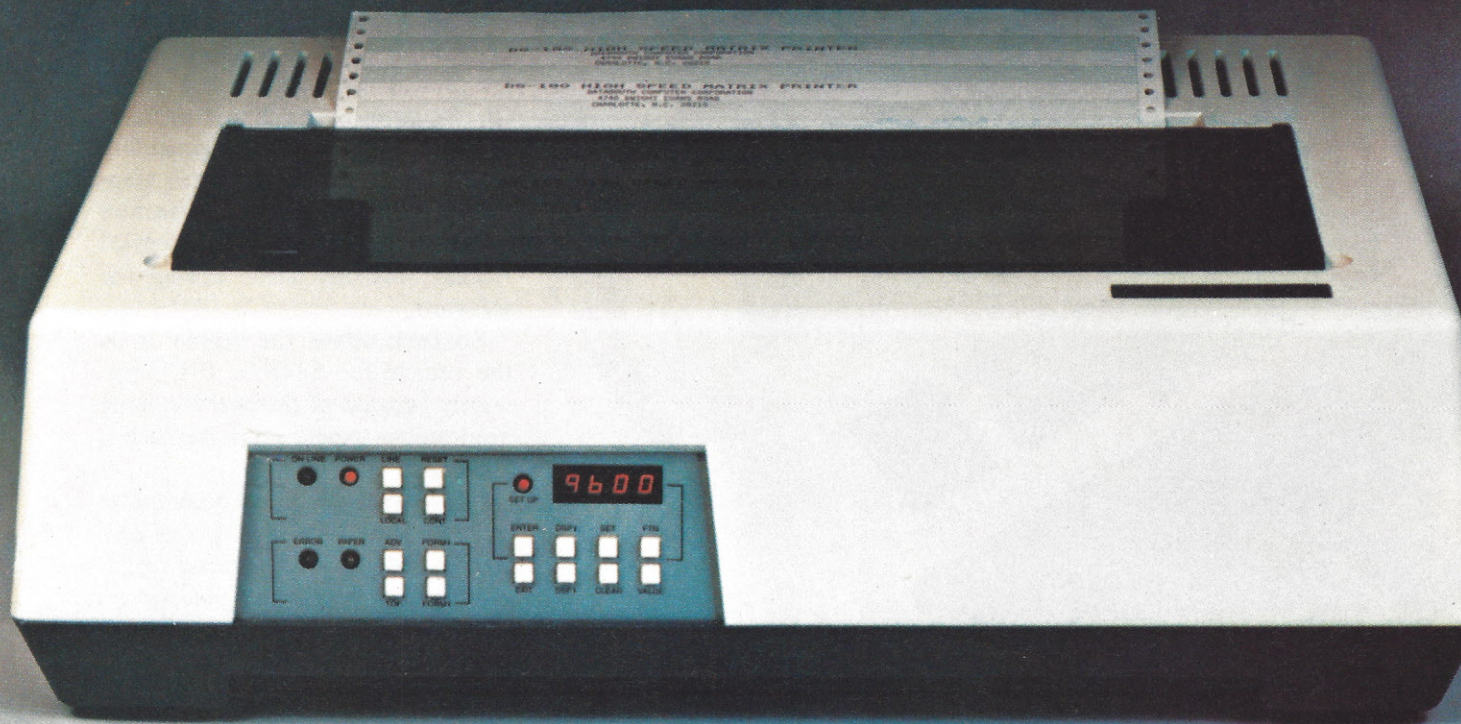
STOCK FILE holds up to 9500 items on floppy disks, ample room for the present and future needs of the small- to average-size business. Harrison says this storage capability was achieved by employing a standard data-processing technique called ISAM (Index Sequential Access Method) when writing the software.

"I previously operated a computer store in Vancouver and I was constantly besieged with requests for inventory programs from Apple owners who were putting together general-business systems," Harrison says. "I checked around and found that there wasn't a good inventory program for the Apple, so we settled on that particular machine for the first STOCK FILE."

An additional feature, one that users are finding especially valuable, is STOCK FILE's extensive report-generation capability. Rather than the standardized reports featured in some of the other inventory packages, STOCK FILE allows the user to create his own specialized reports.

PHOTO BY STEVE EISENBERG

datasouth announces... THE TOTAL PRINTER PACKAGE!



With so many matrix printers on the market today, it may seem tough to find exactly the right one for your application. Some models may offer the speed you need, others the communications flexibility and still others the forms handling capability. But no printer offers **all** the features you need...until now.

The DS180 matrix printer provides the total package of performance features and reliability required for applications such as CRT slave copy, remote terminal networks and small to mid-range systems. Not a "hobby-grade" printer, the DS180 is a real work-horse designed to handle your most demanding printer requirements. And pricing on the DS180 is hundreds of dollars below competitive units.

High Speed Printing—Bidirectional, logic-seeking printing at 180 cps offers throughput of over 200 lpm on average text. A 9-wire printhead life-tested at 650 million characters generates a 9x7 matrix with true lower case descenders and underlining.

Non-volatile Format Retention—a unique programming keypad featuring a non-volatile memory allows the user to configure the DS180 for virtually any application. Top of form, horizontal and vertical tabs, perforation skipover, communications parameters

and many other features may be programmed and stored from the keypad. When your system is powered down, the format is retained in memory. The DS180 even remembers the line where you stopped printing. There is no need to reset the top of form, margins, baud rate, etc....it's all stored in the memory. If you need to reconfigure for another application, simply load a new format into the memory.

Communications Versatility—The DS180 offers three interfaces including RS232, current loop and 8-bit parallel. Baud rates from 110-9600 may be selected. A 1K buffer and X-on, X-off handshaking ensure optimum throughput.

Forms Handling Flexibility—Adjustable tractors accommodate forms from 3"-15". The adjustable head can print 6-part forms crisply and clearly making the DS180 ideal for printing multipart invoices and shipping documents. Forms can be fed from the front or the bottom.

If you would like more information on how the DS180's low-cost total printer package can fill your application, give us a call at Datasouth. The DS180 is available for 30-day delivery from our sales/service distributors throughout the U.S.

CIRCLE 56

datasouth
computer corporation

4740 Dwight Evans Road • Charlotte, North Carolina 28210 • 704/523-8500

those reports. You can direct the computer to sort items according to the criteria you set down, based on your business and your particular application."

Filtering through

One of STOCK FILE's more enthusiastic users is Wood Griffiths, general manager of Les Hall Filter Service, in Vancouver, British Columbia.

"The efficiency this system has brought to our business is something we've dreamed about for years," Griffiths says.

His dreaming was justified. A warehouse distributor for approximately 50 manufacturers of industrial filter systems, Les Hall sells the filter systems used by a variety of industries ranging from mining to fishing to forestry. While sales are centered primarily in British Columbia, systems are also sold throughout the U.S. and Canada. That adds up to a large inventory volume.

Since 1959, when management at Les Hall decided to take stock of inventory on hand and what was needed, the company has been faced with a two-week ordeal of sifting through a massive card file for the required information.

"We were on the old Kardex system for years," Griffith says. "There were thousands of cards, each assigned a part number. Each time a transaction was made on a particular part—when it was purchased, its purchase price, when it was sold, what the customer paid for it—that transaction was written down on the card. We only conducted inventory once a year, and it was a chore everyone dreaded."

Manual inventory, even when performed with the greatest care, more often than not results in error. If you can imagine how laborious recording information on 10,000 transactions is, then you have a good idea how easy it is to make a mistake. At Les

Hall, even a one percent error factor meant problems. Those problems led Griffiths to seek out an alternative inventory-control system.

"We knew we needed a computer to handle our stock," he says. "There were a lot of systems on the market, but nothing fit our needs until STOCK FILE became available for the Apple II. Many of the higher-

offer. He is also impressed by the variety of reports the program can generate.

"We are using 26 active vendor codes," he says. "We can ask the computer to give us an inventory of value for one or all of those vendors. We simply key in the vendor code, ask for a listing of all the active or inactive part numbers within that

"Now when we want to know how many parts are used for manufacturing 2000 units, all we do is give the computer the 2000-unit figure and it automatically pulls out of inventory all the items that were used in the process."

priced systems provided features we didn't need, and they seemed to be rather inflexible. For a price that fit our budget, we got a powerful system that was designed for our particular application."

A growing system

The Les Hall system consists of the Apple II Plus with 48k of memory, four floppy disk drives, a printer and the STOCK FILE program. Since each disk holds approximately 3000 items, Griffiths feels the system will meet not only the company's present inventory needs, but future needs as well.

"This system is designed to grow as our stock grows," he states. "We currently have about 2200 items in our active parts file, and as that number increases, we'll simply use another disk."

Griffiths is especially impressed by STOCK FILE's fast retrieval speed, which, he claims, the more expensive systems he considered were unable to

code, and we've got them almost instantly. If we want to print a report, we just go to the PRINT REPORT sequence, and there's an entire menu for printing any report we want."

Griffiths recently ran a master-listing inventory for one of the 50 vendors with which his company does business. In 40 minutes, he knew the amount of business Les Hall had conducted with that vendor down to the last penny. Had he employed the old Kardex system, that procedure would have taken at least a day to complete.

"Not only is this system fast and efficient," Griffiths says, "but it also prevents a lot of the human errors that occur in a manual system. You really have to be determined to do something wrong to fool the computer."

Recovering the fumble

Frank Fry of Frank's Gun Shop in Yuma, Ariz., figures that what's good for the industrial segment is good for the sporting-goods market.

Like Les Hall, Frank's Gun Shop recently converted its inventory to the Apple II Plus and STOCK FILE.

"The change in the way we handle our stock is like night and day," Fry says. "Before, we were fumbling through hundreds of cards trying to get an idea of the stock we had on hand and which items we needed to reorder. Now it's just a matter of hitting a key and having the information in front of us."

A sporting-goods store leaning heavily toward firearms, the gun shop handles gun bodies, individual parts (firing pins, sights, etc.) and accessories (holsters, bullets and cleaning cloths). The shop also carries a line of police-related equipment. With only two full-time employees to run the store, keeping up with inventory is a big job.

For nearly 19 years, Fry tracked inventory with a standard card-file

system, relying on periodic visual inspection to stay on top of things. A complete inventory was conducted only once a year.

"The system just wasn't efficient,

point-of-sale work. The Apple worked fine; it was the software that came up lacking. Then STOCK FILE came along.

"I had almost given up hope of

"The system prevents a lot of the human errors that occur in a manual system. You really have to be determined to do something wrong to fool the computer."

but affordable alternatives weren't available for a store of this size," Fry says.

The situation changed with the influx of personal computers into the small-business market. Hoping to take advantage of low-cost computer power, Fry bought an Apple II in July 1980 to handle inventory and

finding an efficient way to handle my stock," Fry says. "Then I heard about this new program for the Apple. It's really made quite a difference."

Fry got STOCK FILE up and running on the Apple in August and is still in the process of entering active inventory items. When the conversion is complete, he expects to

Twenty questions to ask about inventory software

Buying inventory software will be one of your most important and most difficult decisions. Arm yourself with the specific questions below before asking a dealer about the performance of his inventory packages. If you plan to buy through mail order, send for a brochure first, and check to make sure it answers all your questions. If it doesn't, as it most likely won't, call the software house and get your questions answered.

Because each business is different, these questions should be considered a starting point. Add your unique considerations to them before you shop.

(These questions were prepared with the help of Ron Wong of AMD Consulting, Ltd., New York, NY, and Ron Sawyer of Lifeboat Associates, New York, NY.)

1. What type of inventory system do I need?

- a. Finished goods
- b. Raw materials
- c. Retail
- d. Pseudo-retail—buy and sell only
- e. Multiple systems, including bills of materials

2. How are the system's item number codes derived? Does it differ substantially from your existing numbering system?

3. How many characters does the program allow for descriptions? (The more the better.)

4. Can it handle more than one price per item?

5. Does it allow you to include more than one vendor and one cost per item? If not, how does

the system handle more than one vendor per item?

6. Will it allow for returns and adjustments to inventory?

7. How many inventory periods does it provide? Month- and Year-to-Date only? Multiple periods?

8. How quickly can you query a single item, and how? Do you query by description, item number or vendor; by two of those, or by all three?

9. Does it integrate with a General Ledger package? Accounts Receivable? Accounts Payable? Job Costing? Order Entry?

10. How much storage capacity do you reasonably need? (Ig-

have a running file of about 2500.

Fry's present system consists of the Apple II Plus, two disk drives and the STOCK FILE program. He plans to expand his number of drives within the next 12 months as his inventory grows.

While affordability was a big factor in choosing the Apple and STOCK FILE, Fry sees the extensive report-generation feature of the system as its biggest plus.

"We've got two separate sets of reports we're generating from the same disk," he says. The first is a price list for merchandise, which is available to the public. It gives the item, its part number and its price. The second parts list is for internal use, keeping Fry up to date on the status of each part.

"The machine is able to separate the two sets of reports, so when we want to print one of them we don't

have to print the other just to get the data we need," Fry says. "I didn't expect to find a feature like this on such a reasonably priced system."

The rest of the pack

Norm Mendon of Mission Manufacturing in Tempe, Ariz., seems quite content with the result of his recent conversion to computerized inventory.

"We installed a Commodore 8032 with the Accounting IV package in September and we've already seen a big difference in our efficiency," Mendon says.

Accounting IV, a product of Business Enhancement Corporation, was developed specifically for Commodore systems. In addition to its other general-business functions, it features an impressive inventory program. With the capacity to handle up to 2000 inventory items on a

single-sided floppy disk, the program allows the user to keep track of item shrinkage, old and new part numbers, vendor numbers, minimum and maximum quantities on hand and gross margins.

Mission needs that kind of capability. The company manufactures a home-cooling unit called Up-Dux, a product that eliminates the need for keeping doors and windows open when using an evaporative cooling system. Installed in the ceiling of every major room in a house, the Up-Dux ventilates through the home's attic, rather than through an open door or window. According to Mendon, this adds to a home's security as well as its cooling efficiency.

"The Up-Dux is small—only about a foot square, but each unit contains about 50 parts," Mendon says. "We sell through distributors all over the Southwest, so you can imagine what

nore the minimum system because it will rarely hold enough records to accommodate your system.)

11. How many files can be written to each disk?

12. What reports and lists does the package provide?

- a. Master (or Stock) List
- b. Price List
- c. Back Order Report
- d. Order Report
- e. Departmental Summary
- f. Reorder Report
- g. End-of-month or End-of-Period Report
- h. End-of-Year Report
- i. Physical Inventory Worksheet
- j. Transaction Control or Audit Trail List
- k. Inventory Turnover Report

- l. Inventory Shrinkage/Overage Report
- m. Items On Order Report
- n. Returns and Adjustment Report
- o. Back Ordered Items Received Report

13. Does the program describe quantities *committed*, but not shipped in addition to items on hand and on order?

14. How does the package measure quantities? By unit or by measurement, such as dozens, quarts, ounces, gross, etc.?

15. Does the package provide for identifying inventory by warehouse or bin location?

16. What costing method do you need and what does the

package provide?

- a. Average
- b. Weighted average
- c. Standard cost
- d. LIFO (Last In, First Out)
- e. FIFO (First In, First Out)
- f. Multiple methods

17. Do your sales consist of cash and billing? Or only one way? How does the package handle them?

18. How does the package help you identify slow-moving items?

19. How does the package carry out sort and search functions? How many sorts and searches does it allow?

20. How long has the package been available? How many companies have used it and for how long?

keeping up with the inventory is like."

Until the computer system was installed, keeping up with the inventory was a tough job. Rather than a card file, Mission employed a loose-leaf notebook, and each page was assigned a particular part number. Every time a part was used in assembling an Up-Dux, someone had to make an entry in the notebook. That's what inventory tracking was like B.C. (before computer).

Although Mission is still in the process of converting its business operation over to the Commodore and Accounting IV, the company likes what it sees so far.

"Now when we want to know how many parts are used for manufacturing 2000 units, all we do is give the computer the 2000-unit figure and it automatically pulls out of inventory all the items that were used in the process," Mendon says. "This is allowing us to get back to the jobs we're supposed to be doing instead of scratching away in a notebook."

Lightening the load

James Hansen shares Mendon's feeling of relief. A successful dealer of antiques and fine art to a worldwide clientele, Hansen has learned over the past year what a difference computerizing inventory control can make.

"Unlike someone who has a retail store or a manufacturing operation, I don't have all of my inventory stored in one warehouse," Hansen says. "Since I work with clients all over the world, I have to keep track of pieces all over the world. Believe me, that's quite a task."

The load has lightened considerably since Hansen installed a N.N.C. Electronics Model 80-W computer with Peachtree Software's Series Five inventory package in his Santa Barbara, Calif., headquarters. Written in MicroSoft BASIC for any computer using a CP/M operating system, Series Five runs on either floppy or hard disks. The number of line items it handles is limited only by

the storage limitations of the disk.

"I decided to opt for a 10-megabyte hard disk and a supply of double-density floppies to handle my inventory load," says Hansen, who says that he anticipates tracking more than 100,000 items by the end of 1982.

Each time Hansen acquires a piece, everything he knows about it is stored in the inventory program—a description of the item, what he paid for it, where it's located and when it's scheduled to arrive. When he sells a piece, he also logs in the price, to whom it was sold, the conditions of the sale and where the item is being shipped.

"For 10 of the 11 years I've been in this business, I kept track of items I was buying and selling using a huge assortment of index cards," Hansen says. "If a client wanted to buy a specific piece, I could spend hours sifting through all those cards trying to locate the item. Sometimes I could find it and sometimes I couldn't. I wasted

a lot of time searching."

Now that the inventory tracking is computerized, Hansen is able to operate more efficiently. If a client calls from West Berlin seeking a painting by a specific artist, Hansen can have the computer sort through the file, assembled by either the artist's name or the art form, and locate what the client is looking for in a matter of seconds. If the painting is not available, Hansen can use the computer to locate another painting in which the client might be interested.

"In addition to the pieces I track for myself and for my clientele, I keep records of other dealers' inventory and that of a number of museums, Hansen states. The Series V keeps track of restoration information, auction pieces around the world—just about everything. When I think back to how I kept up with all this information without my computer system, I'm amazed that I lasted as long as I did." 

Others in the family

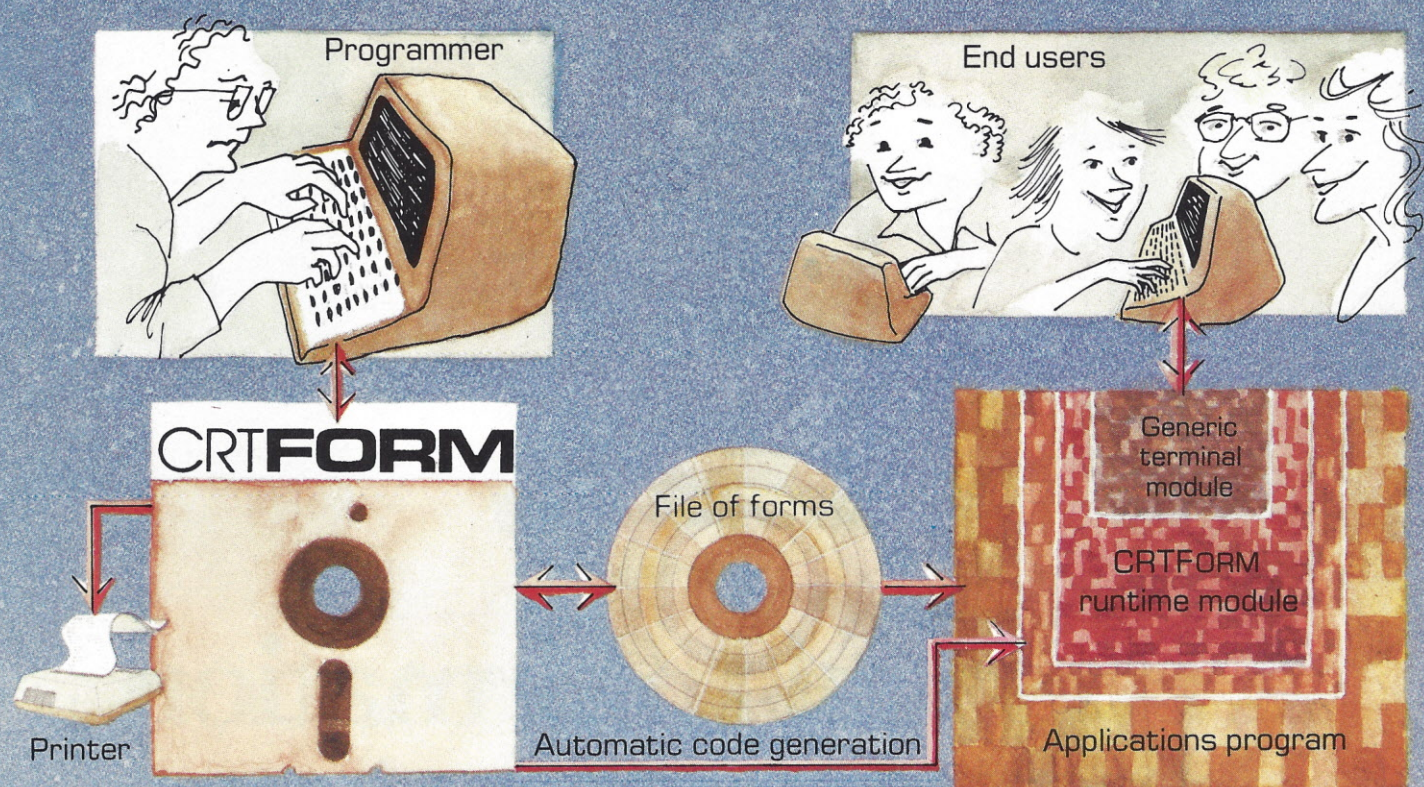
The number of inventory packages for personal computers continues to grow as the need for fast and efficient inventory control increases in the small-business sector. The following are included in the current group.

- MICROINV from Compumax, which has been marketed to Apple, Commodore and TRS-80 users, was recently introduced as a package for the Atari business system as well. The package enables the user to handle up to 3000 inventory items on a single-sided floppy disk.
- OEIC (Order Entry Inventory Control) from American Business Systems runs on 16 of the market's most popular personal

computers, including TRS-80, Cromemco, Dynabyte, Altos, Onyx and Zilog. Written for single-sided, single-density floppy disks, the program supports 1000 open items, 1000 products and 750 customers on each disk.

- INVENTORY from Computer Place was written strictly for North Star's line of business computers. Run on a double-density disk, it holds up to 1800 line items and on a quad density, it holds 3600 items.
- Structured Systems Group offers an inventory package designed for any CP/M system. Simply called Inventory, it runs on either dual 8-inch floppy disks or hard disks, and handles up to 2000 items.

Tired of writing (and rewriting) customized and friendly error free code?



CRTForm™ is a programmer productivity tool that saves time.

CRTFORM produces a friendly bug free interface between end users and the applications programmer.

CRTFORM makes sure that end users enter information correctly, and gives error messages (in plain English) if they don't. It guarantees that programmers will receive correct information without having to write hundreds of lines of error checking code.

CRTFORM allows you to modify program input specifications without requiring expensive and time consuming changes in applications code. It even generates a source code skeleton (Pascal, BASIC, COBOL, FORTRAN, PL/I, and Ada) to interface the programmers' application code to the CRTFORM runtime module.

The CRTFORM package consists of:

- A forms manager that manipulates random access files of input specification forms.
- An editor that creates and modifies the specifications forms.
- A print utility that produces hard copy of forms and their specifications.
- A code generator that writes source code skeletons for ease of program interfacing.
- A terminal-independent runtime module in the machine language of your host processor.

CRTFORM is available under the CP/M, UCSD, and Apple Pascal operating systems. Please call or write for further information on OEM licensing arrangements, or for the name of your nearest CRTFORM dealer.

PROGRAMS THAT WRITE PROGRAMS
STATCOM
CORPORATION

5766 BALCONES SUITE 202
AUSTIN, TEXAS 78731
PHONE 512/451-0221

CIRCLE 11

CRTFORM and Statcom are trademarks of Statcom Corporation — Registered trademark as follows: CPM-Digital Research; UCSD-U.C. San Diego; Apple-Apple Inc.

The pfs: software series*



** Now available for
APPLE III
see your dealer
for details.*

A Personal Information Management System.

Your APPLE* computer really can track purchase orders and inventory, analyze your investment records, maintain client and patient histories, or even catalog magazine abstracts and your stereo collection. Software Publishing Corporation has the answer and it doesn't require programming!

We call it the PFS software series—an easy to use yet powerful set of programs that let you design a system that's versatile enough to manage almost any kind of information.

PFS, the personal filing system, let's you design your own form on the screen for organizing information. Once it's created you just fill in the blanks. Looking up what you've filed is just as easy. PFS can search for a number, a single piece of data, a word within a page of text, or any combination. All forms that match are displayed on the screen for browsing, updating, expanding, or printing. PFS can even create mailing labels.

PFS: REPORT, the personal report system, uses the files PFS creates to produce a report tailored to your

specifications. Just mark the information you want listed and PFS: REPORT will sort it and let you specify headings, totals, averages, counts, and calculations. You can save your report design for use on a regular basis.

PFS and PFS: REPORT come with simple self teaching manuals plus a support plan that includes program updates and factory experts ready to answer your questions. And all of this at an affordable price. Each program is priced below \$100.00.

The PFS software series is different. It is not a specialized application package nor a complex programmer oriented data base manager. It's a personal information management system that lets you store, retrieve, and report information your way without programming. The PFS software series is available through your local dealers. If they don't carry it have them give us a call at (415) 962-8911 or write to us at Software Publishing Corporation, 2021 Landings Drive, MtnView, CA 94043.

able through your local dealers. If they don't carry it have them give us a call at (415) 962-8911 or write to us at Software Publishing Corporation, 2021 Landings Drive, MtnView, CA 94043.



*requires a 48K, 16-sector disk based
APPLE II system

Software Publishing Corporation

BUSINESS COMPUTING

Turning to personal computers in the factory of the future

With personal computers having entered the manufacturing process, production methods are slowly becoming obsolete

Henry Ford in his time was known as something of an industrial pack rat because of his penchant for saving even the most seemingly worthless waste products and reusing them in his factories. One account describes him turning wood shavings into charcoal briquets and creosote and surfacing company roads with slag from his massive steel ovens. And though a hopeless scavenger, what grew out of his eccentricities clearly changed the course of industrial history. The development

of the assembly line, Ford thought, would finally tame the wildcat entropy he saw endemic in large-scale manufacturing.

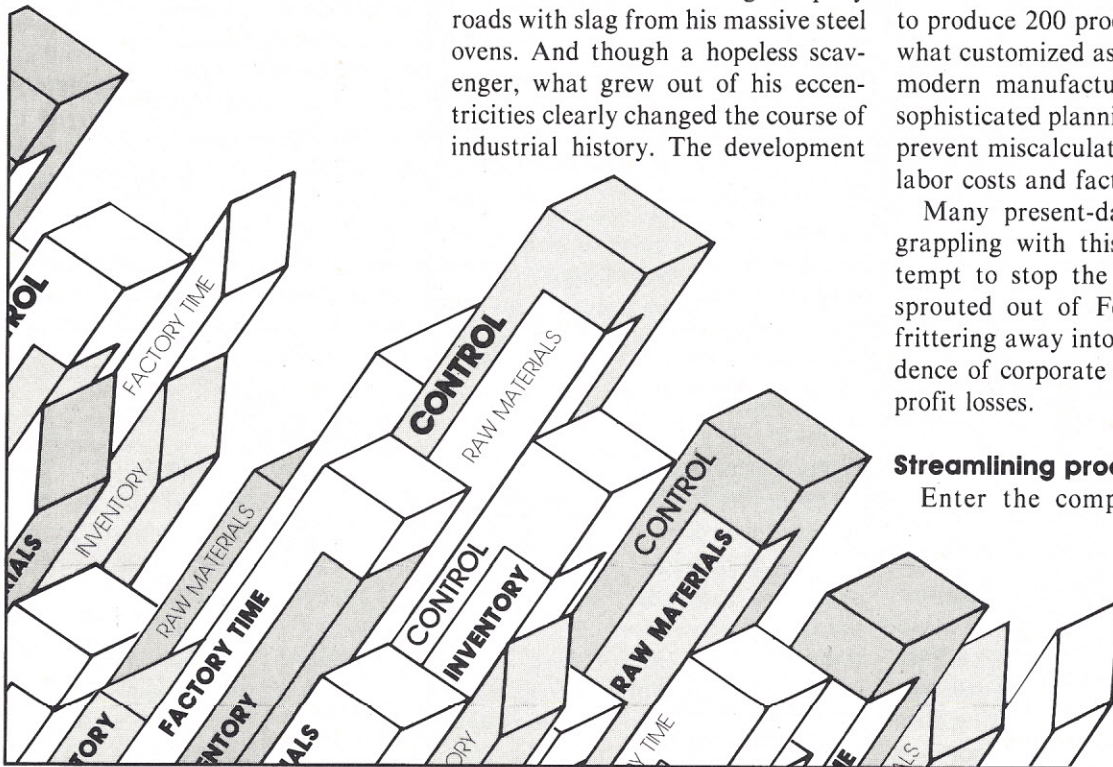
Over the years an array of sophisticated tooling methods have sprung from the example provided by Ford's early automobile plants. But the process of creating many finished products out of simultaneously molding large amounts of raw materials, while still the only god to pray to on the nation's Factory Row, has become more and more difficult—especially during the current era of increasingly complex factory orders and equally inventive designs.

It is a problem with which the old-fashioned craftsman never had to contend. He made one product at a time by taking a certain number of parts and shaping them together in a procedure that took a certain number of man-hours. But if 12 workers are to produce 200 products, each somewhat customized as is the case in the modern manufacturing plant, more sophisticated planning is necessary to prevent miscalculations in inventory, labor costs and factory time.

Many present-day managers are grappling with this issue in an attempt to stop the efficiencies that sprouted out of Ford's seeds from frittering away into the ultimate evidence of corporate inefficiency—job profit losses.

Streamlining production

Enter the computer. Recently,



company leaders have been touting the computer as a way of streamlining the mass-production process. Up to now this manufacturing improvement, considered complicated to achieve, has been strictly provided by large mainframes, and thus out of the price range and data-processing abilities of many smaller- and middle-level firms.

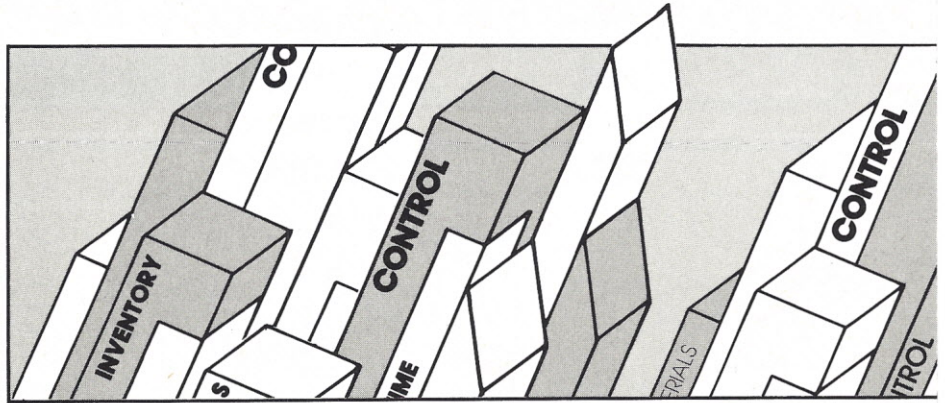
These small-businesses, often already in losing skirmishes with their multimillion-dollar competitors, saw the introduction of the mainframe into the factory as another example of the rich getting richer and the poorer watching. That is, until recently with the emergence of the personal computer.

While it is just a fledgling cottage industry, a few personal-computer manufacturers and software houses, encouraged by an obviously large market among smaller businesses—and larger firms looking to decentralize operations—are shifting their attention to the factory of the future. And although personal-computer implants in manufacturing shops are still relatively rare, the results, when they have been tried, show that a pattern of success is already emerging.

Keeping secrets

A diverse corporate group has begun to turn over its factory data and tooling secrets to desktop machines. Pulp mills. High-technology design shops. Heavy metal plants. Names such as Apple Computer, Pepperidge Farm and Johns-Manville.

Waltham, Mass., smack in the middle of an area that could be dubbed Silicon Valley East were it not for the staunch ethnocentricity of New Englanders, is no stranger to the current "smaller is more beautiful" era in high-technology. The mini-computer came of age in these hills. So perhaps it is fitting that the first real attempt at manufacturing with the personal computer took place in an



engine parts factory five years ago.

Standard Thompson, a division of the Pittsburgh conglomerate Allegheny and Ludlow and the world's largest manufacturer of car and truck thermostats, purchased a Cromemco system in early 1977, after company officials grew tired of watching revenues dissipate in poor raw material procurement for major jobs.

To guard against total failure of the manufacturing process, Standard Thompson, before 1977, had resorted to an inefficient procedure all too common in corporate life: massive overbuying and overstocking of raw materials, which causes inventory costs to skyrocket. Even this often failed to ensure that the factory worked smoothly.

"All of a sudden, anywhere in the assembly procedure, you can find out that some part is missing or has run out, or that somebody forgot to place an order for that part," Peter Langford, materials manager at Standard Thompson says. "And in our business where shipping movements are very dynamic, it could be a pretty agonizing job trying to catch up after you fall behind."

Langford says that before the Cromemco arrived, a large job, such as making hundreds of aircraft thermostatic controls used to gauge the temperature of the fuel as it is dispensed, which employs 30 workers and has a lead time of 30 to 34 weeks, was frequently off the targeted com-

pletion period by as many as three to six months.

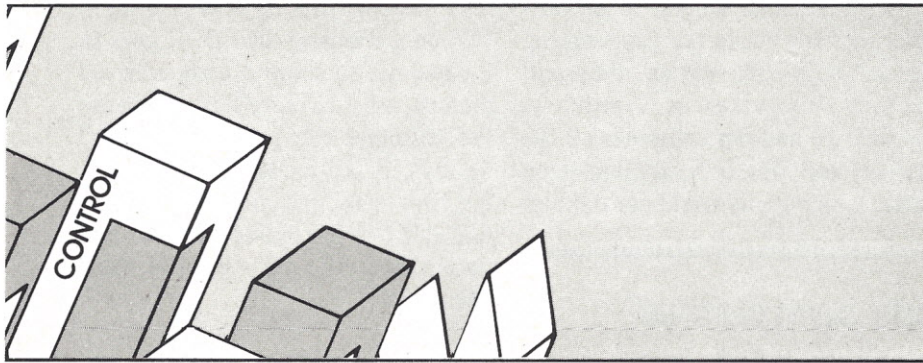
With the implementation of the Cromemco, Standard Thompson's assembly line has been brought under control—the manufacturing time line no longer overruns its goal set at the beginning of a job.

According to Langford, who oversees the operation of the computer, a massive data base has been loaded into the Cromemco, a sort of company-manufacturing history, to orient the machine to the needs of Standard Thompson.

Now at the beginning of a job the quantity of end products needed and the customer's due date is entered into the computer. The Cromemco sorts the new data, comparing it to production rates and man-hour requirements already in its memory bank, and generates a schedule, plus an overall bill of raw materials required. This materials list is then reentered into the computer where it is "exploded" into costs and amounts of the parts that have to be purchased for the job.

Nationwide planning

Langford says that the personal computer—even in the most comprehensive toolings which have as many as 12 succeeding complicated manufacturing levels—has been accurate and made the assembly line a joy to work with again. He adds that the Cromemco's success has led officials at Standard Thompson's parent com-



pany in Pittsburgh to look towards factory planning on a nationwide basis at the corporate level, a massive undertaking that will require large mainframes.

"That was apparently always the overall game plan," he says. "The use of the Cromemco in Waltham has been a good stepping stone because it established computer discipline, allowing the production people to get used to the machines. It also brought the computers in-house where they can be used for purposes other than manufacturing."

Standard Thompson broke important ground in bringing the personal computer into the factory, but it was possible only because the company was financially able to dedicate numerous man-hours and millions of dollars in creating the complicated programs and nurturing their implementation.

For smaller firms, these costs and time appear to be prohibitive. However, in San Diego, Calif., two firms in tandem are attacking this problem and appear to have succeeded in making the future something that will be available across all levels of corporations.

Into the 21st century

Dennis Clark, a vice-president at KW Engineering which makes custom radio-frequency microwave products, got the ball rolling four years ago when he hired Jeff

Comport, a local software consultant, to help develop a system for KW's factory line.

"I realized that the only way small companies could project themselves into the 21st century was through computerization over all levels of their operations," Clark says. "And if you don't have your manufacturing controlled by computer, as well as all your other priorities such as accounting, sales, etc., you're simply not going to make it. The real key to small-business computer use is that you can store specialized knowledge and never lose it. This has to be expanded to factory knowledge as well."

The way KW is using the personal computer—in its case the system is based on two Altos machines redundantly aligned—is not unlike Standard Thompson's setup. A data base of past manufacturing history is programmed into the system's memory and the computer does the rest. It produces a printout that contains a bill of materials, man-hours needed, time-frame, inventory costs and a design.

Clark's enthusiasm for the way the system has operated echoes that of Standard Thomson's Langford. Perhaps the greatest enhancement that KW has been able to accomplish, especially for an advanced electronics firm, is making the personal computer a part of the design team.

"We used to need 20 forms to handle 20 jobs," Clark says. "We were always expediting and de-expediting

or calling a customer and saying we wouldn't be ready on time. Every job would be one week to six weeks late. Before we were never able to optimize the use of a design. We would finish it and move onto another job. Now, with the computer keeping track of minute details of the designing, we are able to apply many of the same drawing-board concepts to similar jobs."

Although KW's success is impressive, it is what has emerged from it that has enhanced the potential for bringing the personal computer into the factory. After presiding over the computer implantation at KW, Comport set out to develop the first all-purpose standardized manufacturing-software package for use in personal computers.

Today Comport's San Diego-based firm, Decisions Methods, Inc. (DMI), provides consultants and system design—including the DMI software—to firms wanting to bring a small, thinking machine into their factories.

"We realize that most companies that have the inclination to use a small computer in their manufacturing process do not have the know-how, the money or the time to be involved in the long haul of implementation," Comport says. "In general, the stickiest problem in this issue is the lack of programs. Up to now everybody has had to go out and reinvent the wheel for their own needs. The magnitude of this problem is huge."

An old wife's tale

Comport says that when it became apparent that the old idea of customizing a program for each factory was akin to an old wife's tale, the concept of standardization became a more palatable notion. "There really is no need for customizing in this regard," he says. "The manufacturing process for everybody is essentially the same. You take raw materials and create a

product from them. What we are doing, as with all computer programs, is helping companies manage a timeworn process." Comport adds that the only customized aspects of DMI's programs are in paper procedures that need to be tailored to the

"It may sound simple to an outsider, but it's not to the guy working inside," says Rick Parker, pulp-mill project supervisor at Longview. "Before we had our computer all the worker had was a residual oxygen meter which really could not tell him

least according to KW's Clark. "When a company like DMI goes to a customer to setup a computerized factory, it has to move slowly because the customer can get MRP shock," he says, based on the experience at his firm. "To the customer it looks like DMI is just going in there and taking over the very guts of their operations."

"The only way small companies can project themselves into the 21st century is through computerization over all levels of their operations."

individual corporation's filing habits, such as special forms and reports.

In the Northwestern lumber regions of Oregon and Washington, massive paper mills toss acrid sulfuric odors into the cold, wet air, while inside, the factories' furnaces eat a carefully balanced recipe of chemicals to achieve defined conditions for cooking the pulp. The ovens' requirements are tedious and exacting. Deviations have been known to unravel the process.

Until recently feeding the furnaces was done entirely by hand, and luck, at times, was the only partner on which the mill operator could count. Now, in some plants, the personal computer is being used as a supervisory instrument to control the pulping fire.

One of the latest milling companies to join the bandwagon—but already able to quantify its success in dollars—is Longview Fiber, a liner bond and paper bag manufacturer in Washington. Last year Longview purchased an Apple computer because the company was not able to put a lid on costly inefficiencies resulting from the wrong mixture of oxygen and cooking chemicals such as sulfur.

enough about the furnace's needs. Now the Apple gives the operator advice as to what the exact air and fuel ratio should be."

Parker says that Longview auditors have estimated that the company could expect \$100,000 in annual savings for each percent of excess oxygen it shaved off. "We used to average 4½ percent excess oxygen and now with the use of the Apple we're down to 2 to 3½ percent in excess," he adds. "That means we've saved anywhere from \$100,000 to \$200,000 already this year. It clearly more than pays for the computer."

While no plan is in the works as yet, Longview officials would like to expand the use of the personal computer to other furnace operations. Larger mills, they point out, are using computers for setting up milling points and controls, another inexact manual process.

From new conceptions in high-technology, acronyms are always born. So it is with computerized manufacturing which has been dubbed MRP, for material requirements planning. In this case with the birth of the acronym and what it stands for, a whole new psychological syndrome appears to have emerged, at

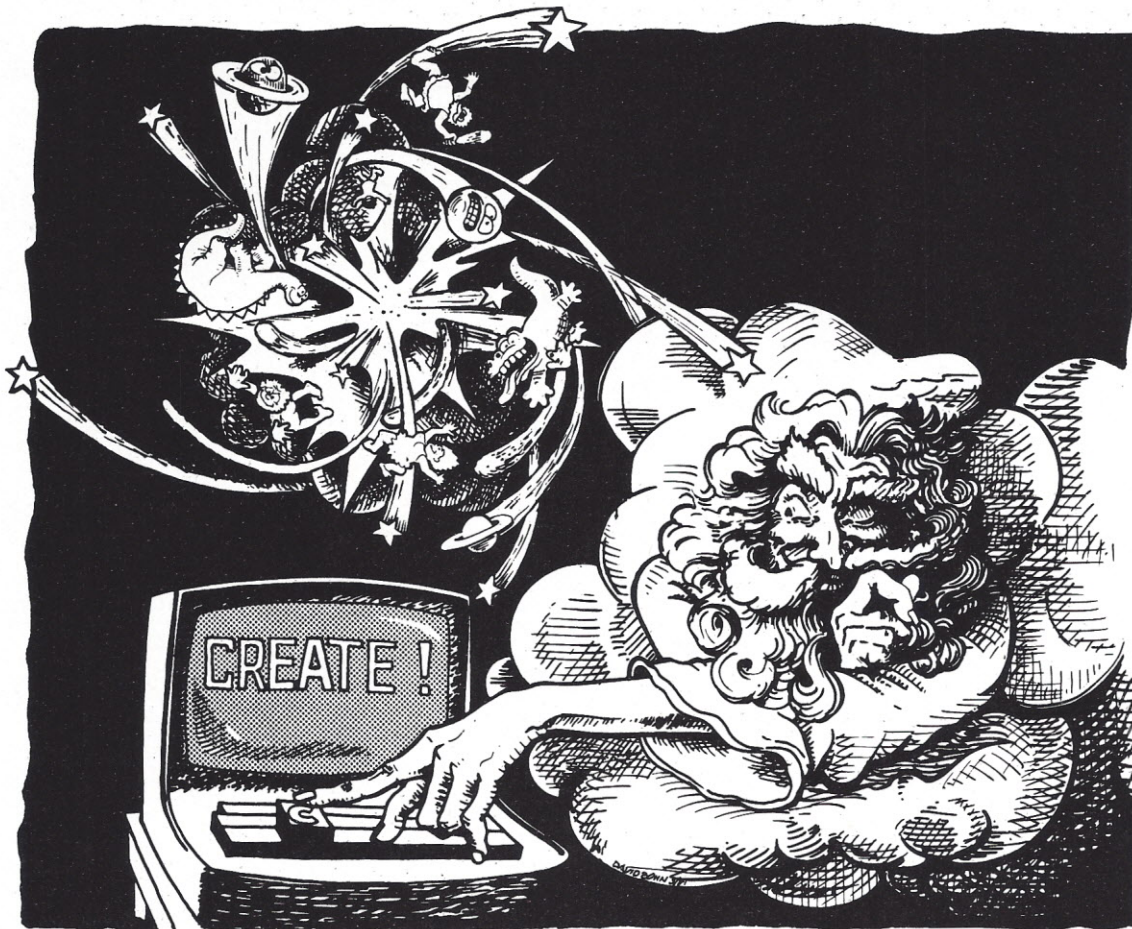
Suspicious arise

Actually there is some truth to the suspicions of the customer firms. Overhauling a time-tested, if somewhat inefficient, manufacturing system—especially for smaller companies—could make a corporation financially vulnerable if the new process fails. Considering the number of suits because of computer blips in other fields that led to bankruptcies—Burroughs, for instance, is a defendant in numerous court cases—a firm changing over to the factory of the future has a right to be skeptical.

Comport of DMI agrees that the stakes are high—"KW would clearly be very sensitive to hardware failures," he says, "because they really don't have the capabilities to build much manually anymore"—but he adds that his company attempts to give sophisticated consultancy to guard against systems that won't work.

"I think the critical thing we try to teach companies, especially those that can't afford twin computers, one to back up the other, is to back up their information often into reliable memory systems," Comport says. "That way even if a failure occurs in the hardware, they don't have to start all over each time they get back online. I'd like to add that if we see a company that wants an application that simply won't fly we have to have enough integrity, whatever it costs us, to not sell it to them. I hope other firms coming into this business follow that line."





if He'd used select[™] it wouldn't have taken seven days

Learn SELECT^{*} in just 90 minutes. A whole new word processing software concept that kicks the coded key habit and frees you from complicated instruction manuals. *SELECT* is fast. *SELECT* is logical. With single key mnemonics, you'll use dozens of commands that instantly access the rich capabilities of this system. There's nothing like it.

Simply hit "C" and you'll be ready to Create a document.

Key "I" and you'll be in the Insert mode.

Key "M" and Move entire blocks of text . . . and key dozens more.

That's all there is to it. You'll get all that word processing software promises . . . plus a few surprises.

SELECT with SUPERSPELL.^{*} The only microcomputer software with an integrated spelling dictionary. To proof your text all you do, of course, is to key "S". *SUPERSPELL* with its 10,000 word dictionary scans your text at computer speed then displays and corrects all your typing errors. You can increase *SUPERSPELL*'s word power and customize the dictionary by adding new words, one at a time. Ask to see it today at your local dealer.

SELECT with SUPERSPELL . . . just a little byte more.[™]



SELECT will run on any machine that uses CP/M or MP/M^{**} or its derivatives. It needs 40K of RAM and two disk drives. Special version now available for Radio Shack Mod II^{***} and Apple II^{****}.

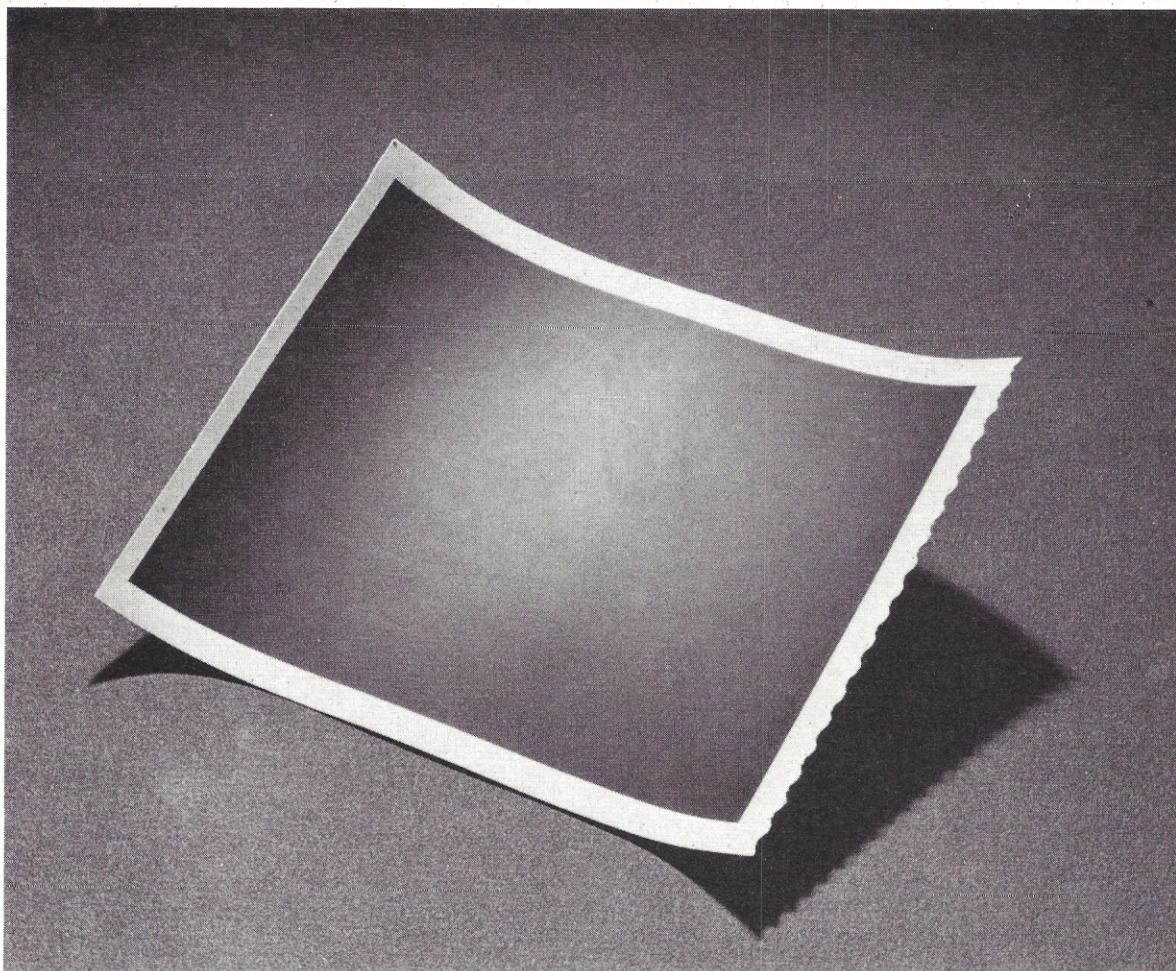
^{*} SELECT and SUPERSPELL are trademarks of Select Information Systems Inc.

^{**} CP/M and MP/M are trademarks of Digital Research

^{***} A trademark of Tandy Corp.

^{****} A trademark of Apple Computer Inc.

919 Sir Francis Drake Boulevard • Kentfield, California 94904 • (415) 459-4003



This is a picture
of all the printers in the world
that outsell the MX-80.

Epson.

The one thing you can't beat in the marketplace is value. And there simply isn't a better combination of reliability, print quality, features and price in an 80-column printer than the Epson MX-80. Anywhere on earth.

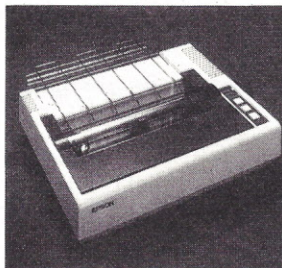
But while we're pleased to make the best-selling 80-column printer in the world, we're hardly surprised. Because we decided a long time ago that the way to succeed in this business is to build a good product, sell it at a fair price, and stand behind it.

So we built our MX-80 with features like a choice of 24 different type faces, graphics that rival plotters, logical seeking, bidirectional printing and the world's first disposable print head. We priced it at under \$650. And if it breaks, we'll be here to fix it.

That seems like a straightforward enough policy. But when we first introduced the MX-80, the competition

laughed. Now they're cutting prices, introducing "new" models, and running splashy color ads, all in an effort to catch up. And they're not laughing.

But you don't have to take our word for it. You've got a choice: you can buy the printer that's been embraced by several hundred thousand computer fanatics all over the world. Or you can buy something else. And take your chances.



EPSON
EPSON AMERICA, INC.

3415 Kashiwa Street, Torrance, CA 90505 • (213) 539-9140

CIRCLE 12

LEISURE COMPUTING

Are the stars out tonight?

You won't have to check if it's cloudy or bright if you fire up your personal computer

It wasn't too long ago that everyone *knew* that the earth was the center of the universe. Now only "flat earthers" and others of that ilk feel that way. We still have the idea that our solar system is somehow the center of things, and that all the cosmos is there for our benefit.

There is probably nothing farther from the truth. Our solar system is only a small part of a huge galaxy, located in one of the spiral arms of

the Milky Way, nowhere near the center. To say nothing of the fact that the Milky Way is only one of a number of galaxies we've been able to identify in the universe, and it's not a particularly big one at that.

The geocentric view of the universe held sway until the advent of the telescope and the scientific method. Then the world view was reoriented to the idea that the earth was not the center of the universe, let alone the center of the solar system.

By 1838, Friedrich Bessel had discovered that over the period of a year a faint star called 61 Cygnii moved in a circle—because as the earth completed a circuit in its orbit, a close star, in this case 61 Cygnii, moved relative to the farther background stars. This discovery conclusively proved that stars are located in three-dimensional space at various points in the universe.

Constellations, which before were thought to have great significance,

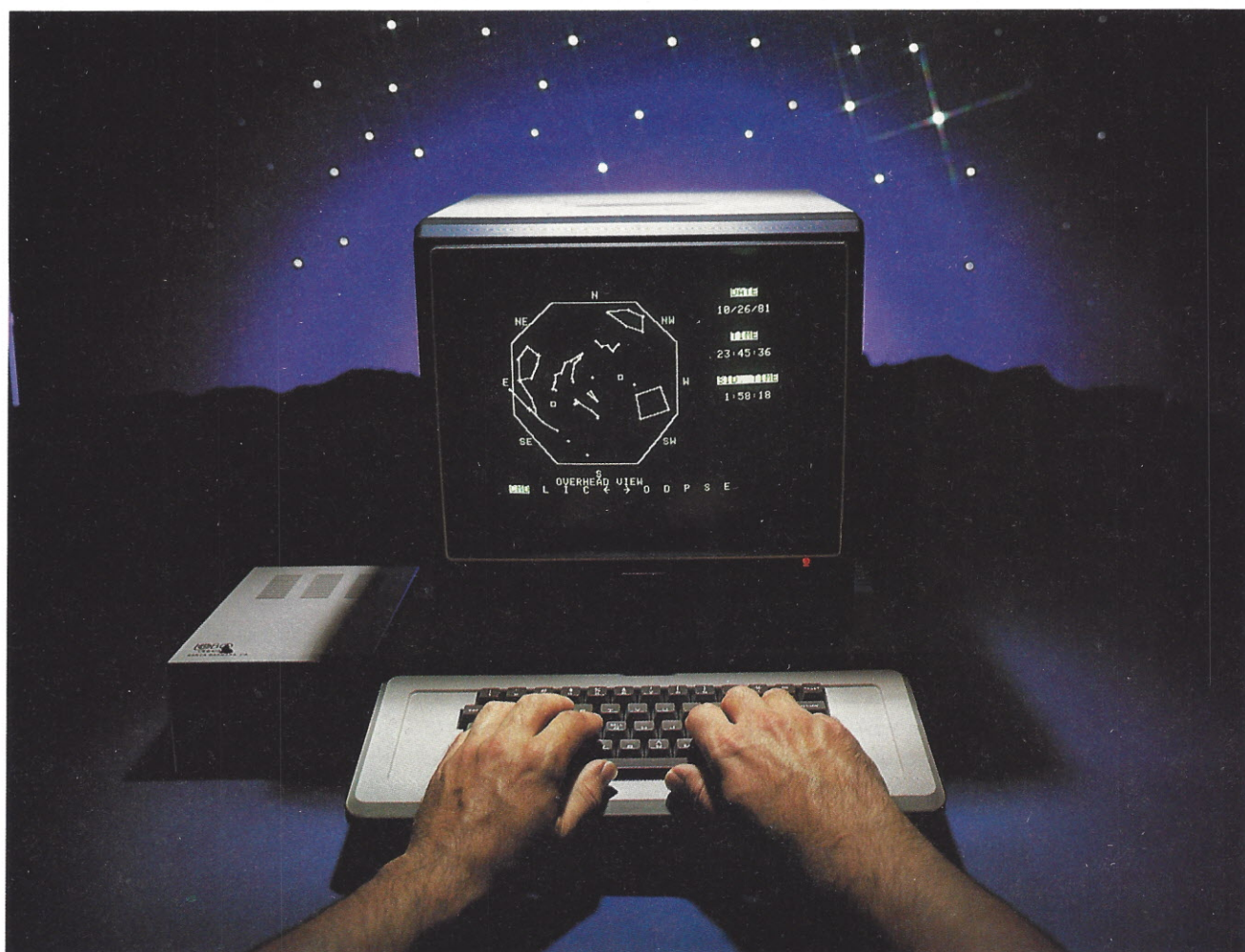


PHOTO BY STEVE SAGALA

now were used as symbolic subdivisions in the sky. But constellations still played a large role in the thinking of the average man, since the parallax, or the position change a star makes over a year, is slight—.78 second of arc. So, the average person still regarded the star as fixed at a great distance.

To give a person a feel for the sky, astronomers drew star maps. These maps were projections of star positions as they appeared in the sky. Visible stars are plotted by their declination and right ascension.

Declination is the distance in degrees from the ecliptic, the path the sun follows in the sky. The earth, sun and the ecliptic can be put in one plane, the plane of the ecliptic. The stars above the ecliptic have positive declinations and are in the northern sky. Those below it have negative declinations and are in the southern sky. Each star has a declination lying between plus and minus 90 degrees.

Stars also have right ascensions. Every hour the sun appears to move $1/24$ th of the way around the earth (actually, the earth turns $1/24$ th of the way around its axis). So the right ascension measures 24 equal divisions of the ecliptic, logically called hours. These are further divided into minutes and seconds, $1/60$ th and $1/3600$ th of an hour of right ascension, respectively. The sky is thus made up of an imaginary grid, and any point can be found by knowing its declination, measured in degrees, minutes and seconds; and right ascension, measured in hours, minutes and seconds.

Many textbooks and almanacs contain listings of stars along with their declinations, right ascensions, distances and other information. The distance is usually given in light years—the distance light moves in one year—or parsecs—the distance at which a star would have to be located for it to subtend one second of

arc over the course of one year.

Fairly precise determinations of distances are known for some 6000 stars. Right ascension can be converted to degrees by the simple formula: $RA(\text{degrees}) = RA(\text{hours}) \times 15 + RA(\text{minutes}) + RA(\text{seconds})$. Thus, $16^h 0^m 0^s = 240^\circ 0^m 0^s$. If a star's distance is given in parsecs, it can be converted to light years by the formula $D(\text{light years}) = 3.28 \times D(\text{parsecs})$.

So far, a star's position has been described in terms of three numbers. But the description is that of the location of the star as seen from the earth. A computer let's us move off the earth to see what the stars would look like from some other location—places as far away as the largest number our computer can handle.

The program that appears in this issue will do just that.

Converting data

The process begins with the conversion of position data, which is in spherical coordinates, to cartesian coordinates. To get to these familiar xyz coordinates, use the equations:

$$\begin{aligned}x &= r \times \cos \phi \times \cos \theta \\y &= r \times \cos \phi \times \sin \theta \\z &= r \times \sin \phi\end{aligned}$$

In these equations, r is the distance to a point, in this case the star; ϕ is the declination in degrees; and θ is the right ascension, also in degrees. After inserting the values in the proper equations, the star's position with respect to earth (or the sun, the difference is inconsequential), is in cartesian coordinates.

These numbers can be rewritten in the form: $\vec{R} = x\vec{i} + y\vec{j} + z\vec{k}$ where $\vec{R}$ is a vector whose components (x, y and z) describe it; $\vec{i}$, $\vec{j}$ and $\vec{k}$ are the unit vectors, vectors of length and direction x, y, z .

This equation is a powerful tool for solving the problem of space relationships. Suppose the spherical coordinates for star A and star B are

known. Vectors $\vec{A}$ and $\vec{B}$ corresponding to the stars' location with respect to the sun can then be found using the preceding equations.

By performing vector subtraction, a vector corresponding to the direction and distance of star B as seen from star A can be derived. In fact, B needn't be a star—it can be any point in the universe that can be described by a vector. Vector subtraction (or addition) is easily performed by the equation:

$$\vec{C} = \vec{B} - \vec{A} = (B_x - A_x)\vec{i} + (B_y - A_y)\vec{j} + (B_z - A_z)\vec{k}$$

It is also easy to see that the direction of A as seen from B can be obtained by multiplying the equation by -1 .

And from the earth. . .

Have you ever looked up to the heavens on a clear summer night and recited, "Twinkle, twinkle little star, how I wonder where you are?"

If you've ever questioned which stars and planets are visible on a given day or night, IUS has an answer—TellStar.

The program is billed as, "your computer window to the celestial objects as they appear at your home, or at any location on the earth you desire." It is available for the Apple personal computer and includes appendices containing city locations in terms of longitude and latitude, along with a variety of star tables.

TellStar consists of four main sections: viewing location, viewing time and date, display and calculation.

The program first greets the user with a request to choose a standard, random or new viewing location. Any city in the

This newly derived vector can be disassembled back to its cartesian (x,y,z) coordinates, and these can be converted back to spherical coordinates by the following equations:

$$R = x^2 + y^2 + z^2$$

$$\phi = \arctan(z / (x^2 + y^2))$$

$$\theta = \arctan(y/x)$$

In these equations, $x^2 + y^2 \neq 0$ and $x \neq \theta$ for the solutions of these equations to exist.

From the mathematical discussion a point of reference can be moved from the earth to somewhere near B, providing the locations of A and B are known.

To find these locations and perform calculations, the program is

used. Ordinarily, even with a programmable calculator, the process of getting these numbers would be difficult. With a personal computer these steps can be performed in a fraction of a second.

The listing's data statements contain the spherical coordinates, converted to decimal degrees, for 93 stars and 44 other objects. The program prompts the user for the coordinates of a star and then computes and plots these points as they would appear from that star.

Star gazing

The program allows the user to either use a known star or pick a point

of observation at random. It prompts the user for the star's name. It uses the convention of a Greek letter and a three letter contraction. For example, UMA stands for Ursa Major, the Great Bear, while ORI stands for Orion, the Hunter. The Greek letters used in the textbooks are converted to their English equivalents; that is, $A = \alpha$, $B = \beta$, $G = \gamma$, etc. Thus, the α star in Ursa Major is A UMA.

Here's how the program runs. After execution is initiated, the screen displays the title of the program for a few moments, and then asks if you care to see a specific constellation. There are two responses you can give to this question. A response of

world can be chosen, providing the user can give its longitudinal and latitudinal location.

The next section asks the user to specify a particular date and time of viewing. A series of statistical data about the chosen location, date and time is then presented on the screen.

The display section of the program contains high-resolution graphic representations of the celestial objects present in the sky at the requested location, date and time.

The calculation section provides a series of astronomical calculation utilities. These routines can be very valuable to amateur astronomers.

TellStar's accuracy depends upon the celestial object in question. Accuracy is typically within 15 seconds of arc, but may vary up to several minutes at the extremes.

Star light, star bright

TellStar has been written to minimize the need to remember facts and figures. The program requires that the user enter his

"standard" viewing location only once, using data from the World Wide Cities appendix.

As an example, consider the viewing location of San Francisco. The program prompts the user to enter the location's latitude in degrees, minutes and seconds, and its hemisphere. San Francisco's latitude is 37 degrees, 46 minutes, 35 seconds, and it is in the northern hemisphere. The program then asks for the location's longitude—122 degrees, 24 minutes, 40 seconds, and it is in the western hemisphere.

The next question the user encounters concerns viewing time in hours, minutes and seconds, and whether or not the user wishes daylight savings time. The date is then entered, including month, day and year.

After the input is complete, the user is ready to let TellStar show its stuff. The display command loads the display section of the program. There are status messages describing the various processes taking place, such as initial planetary calcu-

lations, outer planet calculations and the earth's orbital position.

A picture is worth. . .

TellStar has two display modes, horizontal and overhead. Horizontal presents a view covering 90 degrees of azimuth (an arc of the horizon measured between a fixed point and the vertical circle passing through the center of an object), and from the horizon to straight overhead (the zenith, the highest point reached in the heavens by a celestial body). The overhead view displays 360 degrees of azimuth from the zenith down to 40 degrees of elevation.

Within the display mode the user can request the location of any object in the star tables, identify objects on the screen, draw lines between stars to show a life-like view of the constellations in the sky and shift the horizontal display to either the left or the right. The user may also save the views and data and print the graphics to a Silentype printer.

RETURN causes the program to proceed to the next question. If you input the name of a constellation, then the name is stored for later use.

The next prompt is a request for the point from which you wish to view the star chart. The star you enter is your vantage point, and you see a map of the stars from the star whose name and coordinates you entered.

If you name your vantage point as SUN, the program returns the star map as seen from earth. Entering SUN simply makes the program go to a subroutine that plots each of the data points in the data list. The plotting in this case is much faster than it is if you enter a different star for a vantage point, since no calculations are involved in plotting the star map as seen from the sun.

Constellation plotting

In any case, if you want to see a particular constellation, and input SUN as the observation point, all the stars in the data list are plotted. If you input a specific constellation and

The galactic equator as shown on the display is actually an imaginary configuration of 24 points situated on the rim of the galaxy. The points are over 80,000 light years from the galactic center or nucleus. For distances of 1000 light years or less, the curve formed by these points appears fixed. At greater distances, the curve begins to resemble an ellipse.

There is also a set of imaginary points corresponding to the nucleus. The two small polygons in the lower right-hand corner represent the Large and Small Magellanic Clouds, the Milky Way Galaxy's nearest neighbors. The Andromeda Galaxy is plotted in the upper right-hand quadrant. These galaxies are from 500,000 to 2,000,000 light years from earth. Except from great distances, these also appear fixed.

As you increase the distance from earth, the star pattern gets progressively more distorted. Notice that most, but not all, of the stars become bunched in a small patch of the sky. This occurs because many of

The distance can be increased to as large as Applesoft can handle. For small distances, only the positions of the nearby stars are affected. As the distances increase the distinct bunching takes place. The Milky Way Galaxy is composed of 100,000,000,000 stars, but only an infinitesimal fraction of the member stars are used in the program, giving the false impression that the galaxy is empty.

To examine the spatial relationship of the neighboring galaxies, distances of in excess of 1,000,000 light years must be used. The stars at this distance are then confined to a single point on the rim of the galaxy.

As you work with the program, you will find that it can be modified in several different ways. The stars are represented by simple points in high-resolution graphics. Stars can be classified according to their brightness or magnitude. Magnitude, specifically relative magnitude, is a function of a star's intrinsic brightness and the distance from the star to the viewer. The user may wish to enlarge his data set by including the star's intrinsic magnitude.

The equation that produces the star's relative magnitude can be added to the program in the form of a subroutine, but this would increase the running time of the program. A SHAPE table could then be used to represent the magnitudes of the stars as they are seen from earth or any other point in the sky.

Another modification would be to expand the data set by adding more stars to the list. Distances are fairly accurately known for 6000 stars, and all of these could be added to the list at the expense of run time and increasing screen clutter.

Users can also change the coordinate system from the earth-based cartesian system to one based upon the galactic-coordinate system or maybe even a polar plot.

"A computer lets us move off the earth to see what the stars would look like from some other location."

ask for a different vantage point, only the specific constellation you asked for is computed and plotted. This speeds the plotting from a distant observation point.

When you plot the star map as seen from earth, notice that a sinusoidal line is drawn. The middle line is the ecliptic, the path the sun takes through the sky. But there is another equator that astronomers commonly use called the galactic equator. This is the center line of the galaxy and it's tilted to the ecliptic, hence it appears as a sinusoidal line.

these stars are bright simply because they are relatively near the earth. Other stars appear not to move as much. These are the intrinsically bright stars.

As you move your perspective outward, notice that the stars local to the sun appear to lie in a flattened oval whose major axis is near the curve-shaped galactic equator. These stars lie in a small part of the galaxy. Therefore, the stars "flesh out" a small part of the display and take the galaxy's shape, which is an extremely flattened disk.



The guy on the left doesn't stand a chance.

The guy on the left has two file folders, a news magazine, and a sandwich.

The guy on the right has the OSBORNE 1®, a fully functional computer system in a portable package the size of a briefcase. Also in the case are the equivalent of over 1600 typed pages, stored on floppy diskettes.

The owner of the OSBORNE 1 is going to get more work done—and *better* work done—in less time, and with less effort.

**Unfold it, plug it in, and go to work
like you've never worked before. . . .**

Go to work with WORDSTAR® word processing, so your correspondence, reports, and memos take less time to produce, and say more of what you wanted to say. And with MAILMERGE®—the mailing system that turns out personalized mass mailings in the time you'd spend on a rough draft.

Go to work with SUPERCALC®, the electronic spreadsheet package that handles complex projections, financial planning, statistics, and "what if" questions instantly. For the more technically minded, SUPERCALC will process scientific data and calculate results.

Go to work with powerful BASIC language tools—the CBASIC-2® business BASIC, or the Microsoft BASIC® interpreter.

That's standard equipment.

Options include about a thousand different software packages from a host of vendors designed to run on the CP/M® computer system.

Go to work at the office, at home, or in the field.

Or anywhere. Optional battery packs and telephone

transmission couplers mean you need never work without the capabilities of the OSBORNE 1. That's good, because you won't want to work again without it.

All for \$1795. It's inevitable.

The OSBORNE 1 is the productivity machine that's changing the way people work. Put simply, the machine delivers a significant productivity edge—day in and day out—to virtually anyone who deals with words or numbers. Or both.

Since the entire system is only \$1795, it won't be too long before the guy on the left has an OSBORNE 1 of his own. The same probably goes for the person reading this ad. In fact, we think it's inevitable.

The OSBORNE 1 includes a Z80A® CPU, 64K bytes of RAM memory, two 100 kilobyte floppy disk drives, a business keyboard, built-in monitor, IEEE 488 and RS232 interfaces for printers and other things that get connected to computers, plus CP/M, CBASIC-2, Microsoft BASIC, WORDSTAR, and SUPERCALC. The system is available from computer retailers nationally.

**\$1795. It's
inevitable.**



OSBORNE
COMPUTER CORPORATION

26500 Corporate Avenue Hayward, California 94545
Phone (415) 887-8080 TWX (910) 383-2021

PROFESSIONAL COMPUTING

Intelligent investment management by computer

As more and more people enter the fast-paced world of high-finance, investment managers are finding that a personal computer can be a man's best friend

What enters your mind when you think of the stock market? A huge room full of distraught and delirious people shuffling through little scraps of paper strewn all over the floor? Men and women in expensive tailored suits wheeling and dealing on the phone? Huddles of people gathered around a fluorescent display eagerly awaiting the next

flash of the board?

Or do your thoughts turn more towards a small, quiet office away from the clamor on Wall Street—a place where business is handled using a phone and a personal computer?

Now that the stock market is wired, professional investment managers are turning the personal computer into a tool of their trade. Managing investments consists of purchasing such things as com-



modities, stocks and bonds at a low rate with the anticipation of selling them later at a significantly higher price. Decisions about what to buy and when, and then when to sell have critical financial consequences.

There are currently four areas of investment management in which the use of personal computers is evident: portfolio monitoring, price watching, technical analysis and fundamental analysis.

Fruit salad

A stockbroker who manages portfolios for his clients must deal with hundreds of securities at a time. For instance, John Appel, a broker with Thompson McKenna in Florida, handled 98 portfolios and 340 securities in a six-month period.

"I use the Pear program on my Apple computer to keep from going bananas," Appel says. "Any broker can tell you that the need to cross index and keep track of splits makes recordkeeping a real pain. I've been a broker for 27 years and the books were always a mess. This Pear/Apple combination keeps my records accurate, legible and up to date. I can also write letters with my word processor, do selected mailings to my clients and take it home on weekends to do the bowling scores."

The Pear program was designed by stockbrokers for stockbrokers. It has a master-security file that accommodates up to 500 entries of almost any sort: common stock, a limited partnership or even cash. Only commodities cannot be computed.

"Of the 200 Pear systems now in use, about 60 percent are being used by brokers, another 30 percent by investment advisors and the remaining 10 percent by other users," says Lenore Salsburn, president of Pear Systems.

"One of the interesting things we're hearing from brokers is that the system gives them a distinct edge on their competition," Salsburn states.

She cites the example of a broker who offered to track securities for another broker's client. The client was so impressed by the updated information that he transferred his entire portfolio to the broker who used the Pear program.

There are other portfolio-management systems available, in-

"I use the Pear program on my Apple computer to keep from going bananas."

cluding Apple Computer's Portfolio Evaluator which analyzes each of up to 50 stocks and provides summaries of short- and long-term gains and losses as well as current portfolio value and shares held. The user can also tap into the Dow Jones data base and receive current prices with a time lag of about 20 minutes.

Radio Shack offers Stockpak, a stand-alone portfolio-management system in which users type in the stock prices. They can also tap into Standard and Poor's monthly common-stock data service. A diskette and a newsletter provide about 30 items of current data on approximately 900 common stocks. Users can compare the performance of stocks against any other selected group in the Standard and Poor's file.

Ticker tape parade

Another advantage personal computers provide for the professional dealing with the market involves price watching. Monitoring stock prices is essential in determining when to buy, what to buy and when to sell.

"We live in an information economy where 50 percent of the gross national product has to do with moving information," says Tony Morris, president of Morris Decision Systems. "In the financial community,

keeping on top of the data or coming up with a unique insight can mean a lot of money. I see the personal computer as a key tool that can unlock the individual productivity and creativity of the professional investor dealing with the information economy."

"It's like Mark Twain said," Morris states, "When everybody is digging for gold, it's good to be in the pick and shovel business."

Max Ule and Company in New York is also in the price-watching business, providing what *Fortune* magazine has called a "tapewatchers delight." The system, called Tickertec, is designed to monitor prices of 400 stocks on the American or the New York Stock Exchanges. It will flag prices when they hit a previously determined buy-or-sell level, but it does not make calculations. Quotes are piped in via a Western Union low-speed ticker tape.

Tickertec will work on various personal computers including those from Radio Shack, Cromemco, Vector Graphic and North Star. Of the 60 people presently using Tickertec, approximately one-third are investment advisors, according to Ule.

Another price-watching system comes from First Flight Data Systems in Kitty Hawk, N.C. The Monitor, similar to Tickertec, is an on-line system that works with the Apple personal computer. There are presently 30 packages in use, about half of them by professional investors.

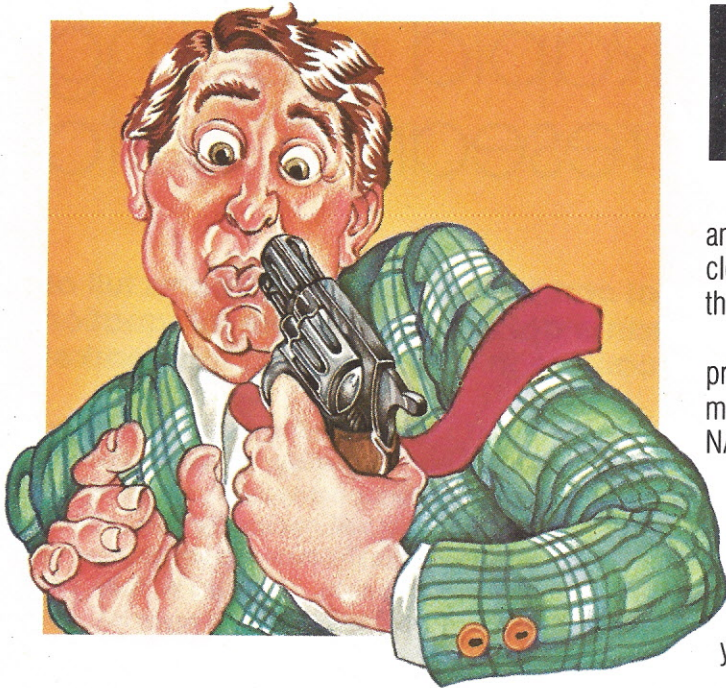
Place your bets

Earl Reiback, a professional commodities trader, makes buying and selling decisions based on "The Reiback Ratio," a technical method he developed for evaluating the success of a trading system based on actual trading possibilities.

"With my personal computer I can complete, in four or five hours, what

continued on page 98

STOP STEALING FROM YOUR OWN BUSINESS



Here's the white collar crime of 1981: Let your people labor away for hours at jobs a properly trained computer can do in seconds.

You **pay** for all those wasted hours.

And you're **missing opportunities**, because the hours could be spent on new, productive, profitable projects.

We can help you.

If you have a CP/M®-based microcomputer, SSG's Business Productivity Packages will scoop up all those hours you're losing and give you back more productivity, more time, more information, and more success.

ANALYST. \$250. An information storage and retrieval (data base) system that will replace piles of files with information you can **USE**.

MAGIC WORKSHEET. \$250. SSG's answer to the world's demand for electronic spreadsheet calculation and "what-if" capabilities on CP/M systems. (Available quarter two 1981.)

NAD Name and Address. \$100. A mailing

and addressing system to do all the typing and clerical work on lists—from ten names to ten thousand.

LETTERRIGHT. \$200. A correspondence processing package that speeds letter writing **AND** merges your letters with names selected from your NAD list.

It takes very few hours at today's salary levels to repay the cost of any of these systems. They'll do you far better than that. SSG's Productivity Software Packages will contribute immediately to the growth and success of your business.

Please act now. Tear out this page. This coupon or a phone call will get you immediate relief from the white collar crime of 1981. We'll send you complete information. Or better still, answer your questions **immediately**.

Time's a-wasting.
That's a crime.

- ☐ Please rush me information on the SSG Business Productivity Packages for CP/M-based computers.
- ☐ Please call me right away.

Name _____
Company _____
Address _____
City State Zip _____
Telephone () _____



CP/M is a registered trademark of Digital Research. NAD, Magic Worksheet are trademarks of SSG.

Structured Systems Group

5204 Claremont, Oakland, California 94618 (415) 547 1567

CIRCLE 47

INCORPORATED

Rapid reading of research data

Personal computers are turning rooms full of mainframe data into digestible information you can use in characterizing that market

The giant computers at Epsilon Data Management, just north of Boston, run day and night to keep up with the market data flooding in from the company's direct-mail marketing clients. Programmers and computer operators work the company's giant Hewlett Packard and Intel computers, spinning out mountains of statistical market-research data on miles of computer printouts. The company directs nationwide mailings mainly for non-profit organizations, like the Cousteau Society, relying on its computer-powered research capabilities to target those individuals most likely to give money.

From its large computers, the company generates dozens of client market reports which detail the effectiveness of one mailing or another, evaluate and analyze the responses to the marketing efforts and pinpoint areas of future marketing potential. The amount of market segmentation and flexibility in direct-marketing mailings that Epsilon can achieve through its use of the computer has

become almost legendary. Its information gathering and market-research capabilities are stunning.

But when Epsilon Data Management clients want to understand exactly what is going on with their accounts, the company's account executives turn on their Apple computer. "We use it to explain all the statistics to the clients," says Susan Eichman, an account supervisor who has been a leader in using the Apples at Epsilon.

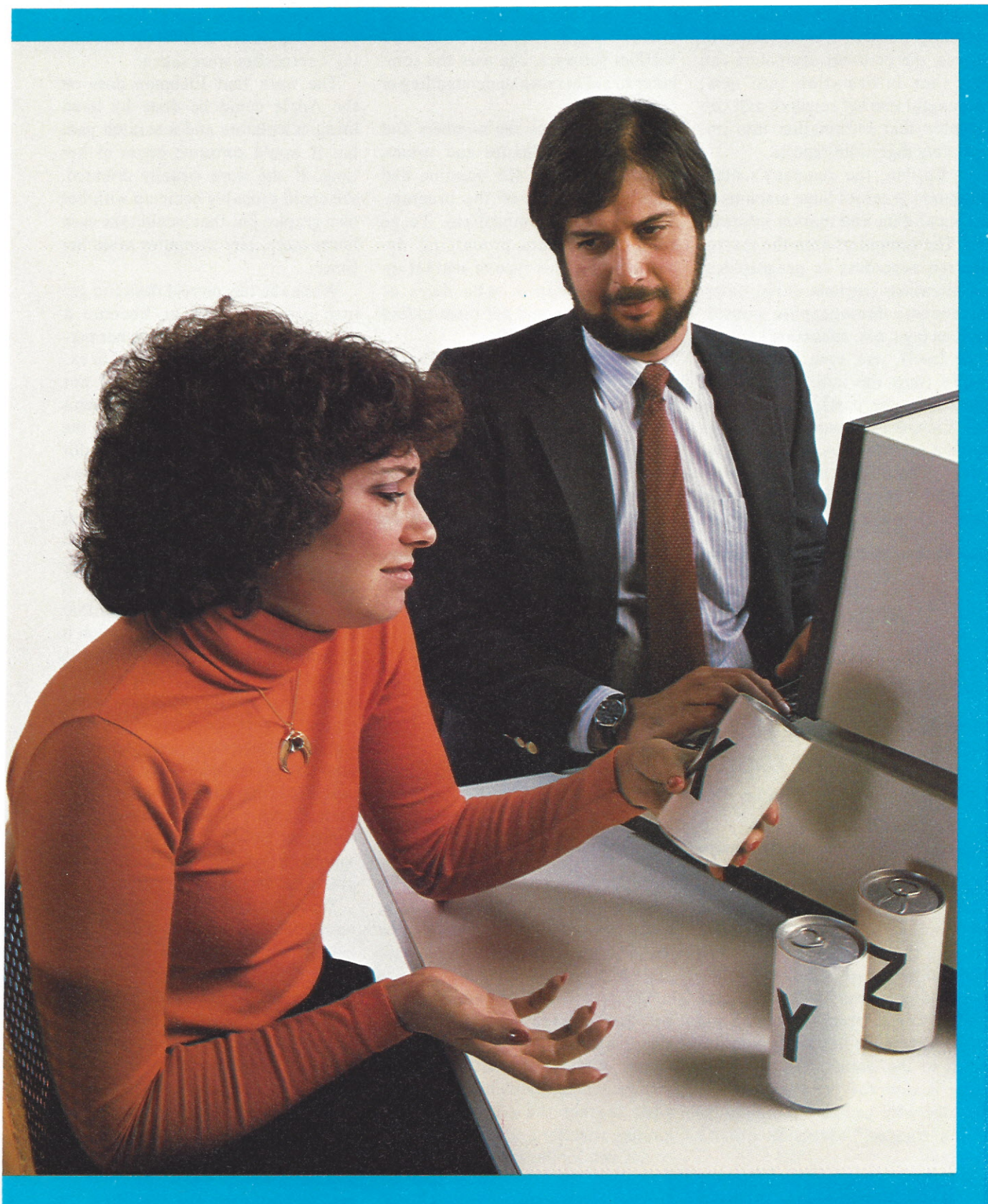
While relatively few marketing companies have developed the computer capabilities that Epsilon commands, more and more companies are discovering that personal computers have a distinct role to play in market research, although the companies may still rely on full-powered, large computers to handle the bulk of the number crunching, statistical computation and analysis. While the large computers with their massive memory capabilities and high speed are still required to handle the bulk of most market research, personal computers are beginning to shine when it comes to rapid evaluation of data.

There are four parts to most market researching: gathering the raw material, processing it, evaluating the results and turning the results into a meaningful plan or report that can be acted upon. It is in the final two stages, evaluating and reporting, that personal computers are showing the most immediate applications.

Although there are some small statistical programs for personal computers, the machines are generally not powerful enough to handle large amounts of raw data: The memory is too small and the programs are too slow. Epsilon's computers will sift through the results of mailings to millions of people, sorting out dozens of different categories of response—something the personal computers simply can't handle.

Digesting the data

However, using VisiCalc and similar programs and improvising with list-management and word-processing programs allows personal computers to sort, analyze and evaluate the market data that is being generated by the large statistical



computers. Relying on primary and secondary research from a variety of sources, the personal computers can turn that information into new, meaningful market research and can assemble that information into immediately digestible reports.

At Epsilon, the company's main computers generate huge amounts of statistical data and market information. The computers scan the market research according to geographical considerations (regions, cities, states, zip codes), demographic considerations (age, sex, education level, income level), and even by recipient history (how the individual has responded in the past). The result is that Eichman's clients end up with "quite a few numbers from many reports." The clients are often overwhelmed. They are often untrained in market research and evaluation, and

pretty, simple graphics. Working mainly with the VisiCalc and VisiPlot software, she uses the computer to aid her own understanding of the numbers.

Eichman inputs the numbers and assigns the coordinates and values, prodded along by the question and answer prompting of the program. The results are immediate. To go back to the data-processing department for this type of market information would take days or weeks—if she could get them to find the time to do it at all.

VisiCalc and similar software packages don't do the market research for you, notes Eichman's assistant. Just as the large computers must be fed the raw data from the field, so the personal computers need the data generated by the large computers. The user must then assign the

if" conjectures using VisiCalc, projecting results if different marketing approaches were taken.

The work that Eichman does on the Apple could be done by hand using calculators and a scratch pad, but it would consume hours of her time. If she were visually oriented, she could probably come up with her own graphs, but that would take even hours more. Her computer saves her time.

While she has no real desire to get into programming or become a computer hobbyist, she finds her personal computer a valuable tool in explaining market research to her clients. It won't ever replace Epsilon's data-processing department, but the personal computer makes it easier for Eichman to use the market research that is generated.

Professional market researchers would agree with Eichman's approach. Kim Wallace of the Boston-based market-research firm of Wallace and Washburn, reports that his company sends the information it collects to outside data-processing houses where it is run through a large computer and returned to him in statistical report form. The complex statistical programs and the large amounts of materials that must be evaluated with his firm's type of market research probably requires more computer power and programming sophistication than is generally available with personal computers.

Wallace is currently running a market-research project for a magazine which uses its own stand-alone DEC personal computer with list-management programs to handle its subscriber list. Even if the magazine wanted to take the time to input the responses from thousands of surveys containing dozens of questions each and was able to get it all organized and stored on floppy disks, the magazine would still not have a program available which would do anything meaningful with the raw data. "I

"Large computers are still required to handle the bulk of market research, but personal computers are beginning to shine when it comes to rapid evaluation of the new data."

they can't really absorb it all. That's when Eichman turns to the personal computer.

Using the reports, Eichman feeds the most important numbers into the Apple II computer, which can turn the array of numbers into charts and graphs that make the numbers meaningful to the clients. "The graphics make it easy for the clients to see the otherwise complex relationships of the figures," states Eichman's assistant.

But there is much more to her use of the personal computer than just

values and determine the coordinates based on the data, essentially filling in the rows and columns provided by the software. A small familiarity with algebra is helpful.

The program allows Eichman and her clients to see the research more clearly and to analyze exactly what it means. It clarifies where the clients' money is actually coming from, for what market the client should be aiming, whether a market is growing or not and similar critical market information, she explains. In addition, she has the opportunity to play "what

microplanTM

the electronic worksheet for CP/M[®] users.

AUTOMATIC
WHAT-IF

MODE=NORMAL ORDER=R/O ROW=1-50 COL=1-20

ROW 1 (Net Sales) <--
ENTER COMMAND:

ROW	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Total	
1	1,000.0	1,100.0	1,210.0	1,331.0	4,641.0	40 MATH:
2	450.0	489.5	532.4	579.0	2,050.9	41 ADD
3	200.0	220.0	242.0	266.2	928.2	42 SUBTRACT
4	300.0	350.0	400.0	450.0	1,500.0	43 MULTIPLY
5	950.0	1,059.5	1,174.4	1,295.2	4,479.1	44 DIVIDE
6	50.0	40.5	35.6	35.8	161.9	45 NEGATE
7	5.0	3.7	2.9	2.7	3.5	46 INVERSE
8	0.0	0.0	0.0	0.0	0.0	47 INTEGER
9	0.0	0.0	0.0	0.0	0.0	48 ROUND
10	45.0	44.5	44.0	43.5	0.0	49 CUMULATE
11	0.0	0.0	0.0	0.0	0.0	50 ABSOLUTE
12	0.0	0.0	0.0	0.0	0.0	51 ADD K
13	0.0	0.0	0.0	0.0	0.0	52 SUB K
14	0.0	0.0	0.0	0.0	0.0	53 MULT K
15	0.0	0.0	0.0	0.0	0.0	54 DIV K
16	0.0	0.0	0.0	0.0	0.0	55 SUM
17	0.0	0.0	0.0	0.0	0.0	56 GET
						57 ZERO
						58
						59

BUILT-IN REPORT
GENERATOR

ELECTRONIC
WORKSHEET

COMMAND
MENU

"The best piece of software . . . ever!"

The industry is buzzing with comments on MicroPlan. Users have supplied unqualified quotes "the best . . . ever."

ALTOS COMPUTERS agrees. The ALTOS budgeting manager uses MicroPlan for revenue forecasts, consolidations, and everyday analysis. DURANGO's Product Manager uses MicroPlan for product pricing and for developing marketing strategies. TOSHIBA's General Manager uses MicroPlan for developing marketing strategies. The DNYABYTE VP of Finance simply says, "it's dynamite!"

And, ADDS' system staff maintains budgets; TELE-VIDEO's Controller reports financial performance; and NORTH STAR's Marketing Manager analyzes sales—all in MicroPlan.

MICROPLAN IS EASY TO USE. You don't type; so MicroPlan is designed for no typing ease. You don't think in formulas; so MicroPlan is designed for pushbutton ease. You are not a programmer; so MicroPlan eliminates all the computerese that makes life difficult.

MICROPLAN SOLVES PROBLEMS. MicroPlan lets

you solve your problems electronically. You enter values into the electronic worksheet. MicroPlan handles all the sums, percentages and ratios. Even complex depreciation, loan analysis and present value computations are supplied—all with pushbutton ease. And when you change one number, MicroPlan automatically analyzes the impact of "what-if" questions.

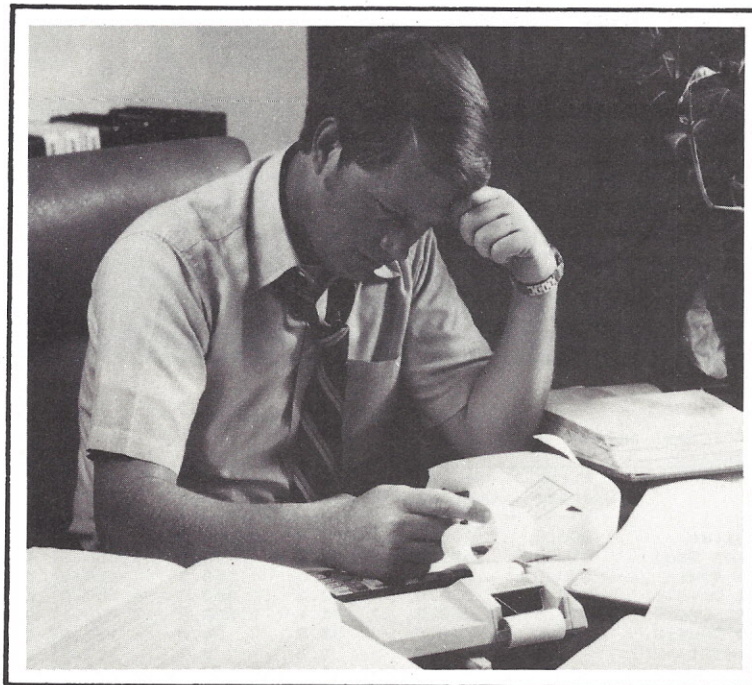
MICROPLAN HAS POWER. MicroPlan has more features and solves more problems. Add-on modules allow you to do consolidations, automated variance analysis, statistical calculations—it even lets you build complex models. And, with MicroPlan solution books you can apply MicroPlan to your business, such as, real estate, tax planning, and sales forecasting.

Call on your dealers. Find out why people are saying "MicroPlan is the best . . . ever!"

MicroPlan is available exclusively through local dealers. For more information, contact: Chang Laboratories, 10228 North Stelling Road, Cupertino, CA 95014; (408) 725-8088.

CP/M is a Registered Trademark of Digital Research.

CASH FLOW PROBLEMS?



IT'S NICE TO KNOW SOMEONE WHO HAS THE SOLUTION.



MicroAge is your Solution Store . . . that means at MicroAge Computer Stores we have a wide selection of time-saving computerized business systems designed specifically to solve the daily cash flow problems every businessman faces.

MicroAge has computerized business systems that

quickly and affordably allow you to regain control of your critical accounts receivable . . . at last making it possible for you to carry out effective collection procedures on a consistent basis. MicroAge has accounts receivable program packages to automatically display and update account information; prepare trial balance

including a balance-due and delinquency aging report, and take care of dozens of other tasks that eat into your time and profit!

Computerized business systems from the MicroAge Computer Store are available in the \$5,000 to \$15,000 range, to suit the individual budget of your small business or professional practice. MicroAge backs up every system with personalized service, warranty service and repair, installation, systems consulting, even customer training. Visit the MicroAge Computer Store in your area soon with your business problems, and let us help you with the solution.

MicroAge[®] COMPUTER STORE

"The Solution Store"

VISIT THE STORE IN YOUR AREA:

El Paso, Texas
(915) 591-3349
Rockville, Maryland
(301) 762-7585
Tucson, Arizona
(602) 790-8959
Albuquerque, New Mexico
(505) 883-0955
Pleasant Hill, California
(415) 680-1489

Aurora, Colorado
(303) 696-6950
Rochester, New York
(716) 244-9000
Hurst, Texas
(817) 284-3413
Salina, Kansas
(913) 823-7596
Orland Park, Illinois
(312) 349-8080

Milwaukee, Wisconsin
(414) 257-1100
Mountain View, California
(415) 964-7063
Scottsdale, Arizona
(602) 941-8794
Anchorage, Alaska
(907) 279-6688
San Diego, California
(714) 278-0623

Richardson, Texas
(214) 234-5955
Minneapolis, Minnesota
(612) 338-1777
Omaha, Nebraska
(402) 339-7441
Phoenix, Arizona
(602) 265-0065
Columbus, Ohio
(614) 868-1550

Indianapolis, Indiana
(317) 849-5161
Portland, Oregon
(503) 256-4713
Norwalk, Connecticut
(203) 846-0851
St. Louis, Missouri
(314) 567-7644
Oklahoma City, Oklahoma
(405) 728-1837

Houston, Texas
(713) 440-7547
W. Palm Beach, Florida
(305) 683-5779
Toronto, Canada
(416) 487-5551
Houston, Texas
(713) 270-9647
Wilmington, Delaware
(302) 368-3672
Allentown, Pennsylvania
(215) 434-4301

would have to write the program myself," which is not likely, says the magazine's advertising sales manager who has become the unofficial computer leader at the small magazine.

"We're looking at the Apples," says Wallace. He and his partner can see a use for the machines although they expect to continue to send raw market-research data out for processing in most cases. Most likely they would use the machine in the same way that Eichman does at Epsilon, although they would probably have to alter the available programs to make it conform to their needs.

Eva Lewin, the resource development director at the Massachusetts Cultural Alliance, a trade organization made up of over 150 member cultural organizations, has a stand-alone DEC personal computer with a word processor and list management. She has a dual disk drive and letter-quality printer, a terminal for time-sharing on a mainframe and a high-speed printer. For the major statistical research and reports that her organization needs, she turns to the mainframe because it has the statistical capabilities, the memory and the speed.

Lewin uses her personal computer to take the statistical information and generate meaningful reports. She is also in the process of setting up the list-management program so that she can handle small market-research projects. Operating on a very small scale compared to Epsilon, Lewin is setting up her lists so that she can sort through the names in a variety of ways, depending upon the marketing effort she has in mind.

For example, if primary research shows that fund-raising efforts are most effective in certain select geographical areas, and through secondary research information she can match those areas to selected zip codes, Lewin could have her personal computer sift through all the names

on her lists, pulling out those from the designated zip codes to target for future fund-raising efforts. It is a very small-scale application of the type of market research that Epsilon handles on a nationwide scale.

As a graduate business student at Boston University working toward her MBA, Lewin had to take on a major market-research project for a client. Using the school's mainframe computer and a sophisticated statistical program, Lewin designed and coded the research questionnaires, inputted the response into the machine and received rows and columns of results that filled sheets of continuous-feed computer paper—the type of market research handled regularly by a firm like Wallace and

combine with her list-management program.

Different drums

Market research means something different to each person. Where Coca-Cola wants to research markets with millions of dollars in potential, a local businessman may be thinking in terms of opening a small branch office in a new neighborhood.

Either way, there are two main types of market research. Primary research is information that has been gathered directly from the field or directly from experience.

The actual results of a survey or the data derived from research from other (secondary) sources such as the U.S. Census or some state

"Using a personal computer and a VisiCalc type of program, you can combine secondary research from several sources and any primary research that you may have to create new market research for new purposes."

Washburn. Eventually Lewin found herself taping the sheets of computer paper to the walls as she analyzed all the results and prepared all the possible interpretations for her client.

Computing the raw data "is the kind of thing that mainframes do best," says Lewin, who has otherwise become excited by the potential of her organization's personal computer. For small-scale market-research projects, her personal computer will be a joy to use, but she expects to continue to rely on the time-sharing mainframe for the bulk of her statistical requirements. What she would really like is an adequate statistical-analysis program to

department or from a trade magazine is secondary market-research information.

Using a personal computer and a VisiCalc type of program, you can combine secondary research from several sources and any primary research that you may have to create new market research for new purposes. That is what Roger Sundin does for his clients.

Sundin, president of the Boston advertising agency Sundin Associates, uses his Apple II to "take primary and secondary information and evaluate it." Again, the personal computer isn't being used to generate the initial data or to statistically process

raw figures. Instead, those figures are being taken from the many publicly available sources and evaluated with the aid of the machine. The result is new market-research data addressing the immediate need of his client and new insights into the research.

For the past year Sundin has used his Apple with VisiCalc and Applesoft programs to track results

Using VisiCalc, he can enter this data, filling in the rows and columns, and begin making his comparisons and calculations in much the same way that Eichman does using the data generated from her company's data-processing department.

Getting familiar with the computer wasn't the intimidating experience that some people have found. Sundin,

"we'd have to sit there all night long with a programmer at our side."

Fun in the sun

One of the most sophisticated market-research applications of a personal computer is being done, not by a marketing company, but by an accounting firm, Laventhol & Horwath. The company has a main-frame computer with a terminal in every office around the country for its data-processing needs, but when it attempts market research, it turns to its Apples.

In its most extensive application of the Apple, Laventhol & Horwath took on a market-research project involving the Department of Tourism for the Cayman Islands. This resort area southwest of Cuba had experienced an unplanned building boom and turned to Laventhol & Horwath to research a 10-year development plan for the islands. It was to be a total market-research project covering every aspect of the tourism business: How many tourists could be expected under various circumstances, how many hotel rooms would be needed, the amount of restaurant capacity, how much income would be generated for the islands and how much employment. "We looked at just about everything," said Karen Mastrobatista, who took on the project.

To begin, the company surveyed everyone concerned with tourism, including airlines, cruise-ship companies, hotels, restaurants, retail shops, bars, clubs and even the tourists themselves.

Using the Apple II and VisiCalc, Mastrobatista fed the information which had been gathered into the machine and began to project forward, selecting a variety of factors. If tourism increased by a given amount, she wondered, what would be the affect on employment? How many restaurants would be needed? How

continued on page 148

"Getting familiar with the computer isn't the intimidating experience that some people have found. It is simply a matter of getting comfortable with the machine."

of the various marketing campaigns he has developed for his advertising clients. Using his computer, Sundin can study the research data, sorting it first one way and then another, testing how it affects his clients.

The type of research Sundin will do might include comparing the traffic of a bank's branch office with the demographic information of the particular locality. By comparing the population of the area to the bank's number of depositors, he can determine market penetration. By grouping the depositors by zip codes and comparing them, he can determine from which areas the bank is more likely to pull customers, where there might be room for growth or where a marketing effort may do the most good. "We can do market share, market penetration, sales potential," states Sundin.

The primary information Sundin will use is information that comes directly from the client such as customer lists, surveys and various research that the client may undertake. The secondary information is information he gets from available sources such as the U.S. Census and trade magazines.

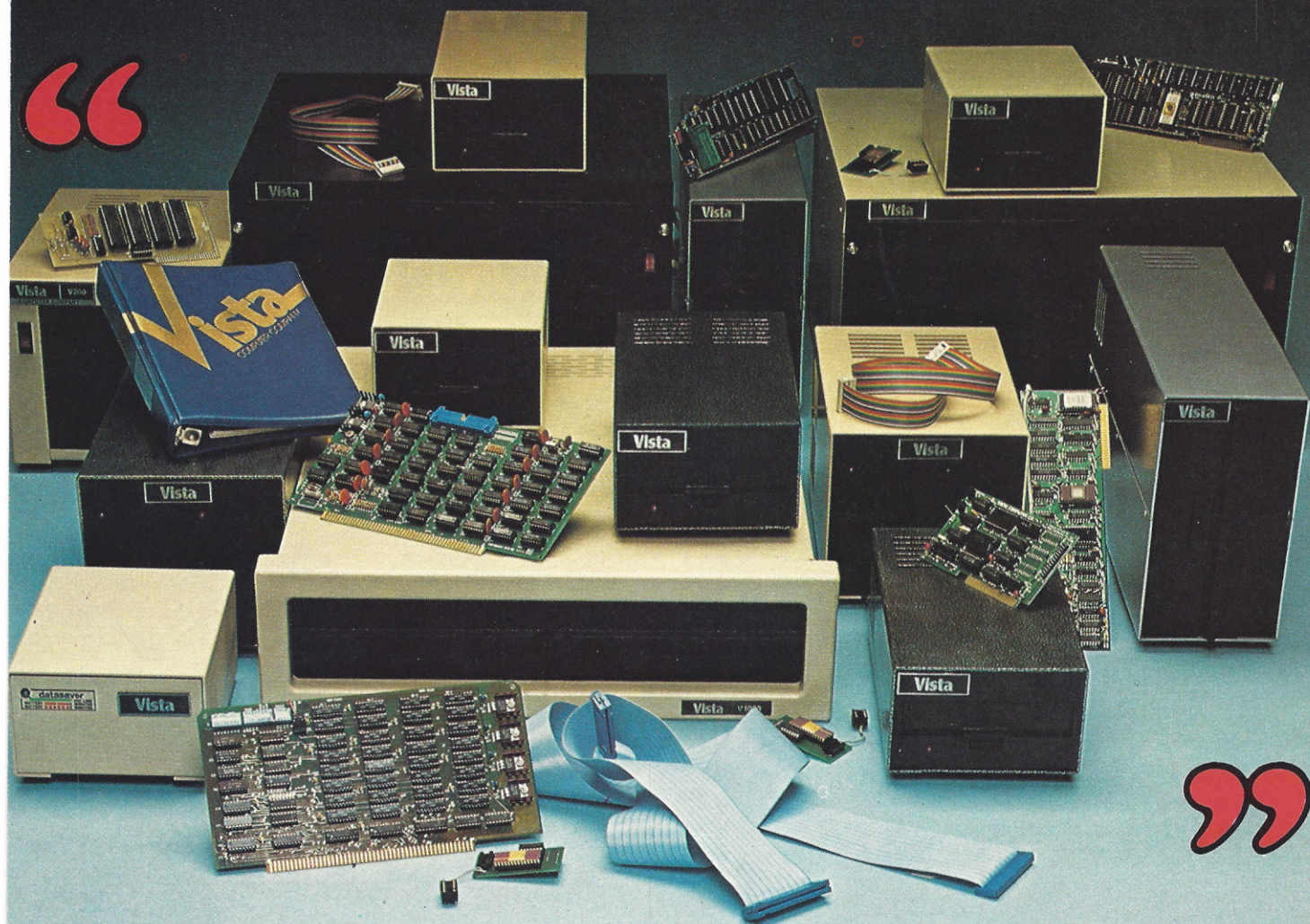
an engineer to begin with, is fortunate to have a computer store chain, Computer City, as his client. "It is simply a matter of getting comfortable with the machine."

His other clients are becoming so impressed with the work he has generated with his machine, that many of them are considering the purchase of personal computers, "and most of them already have data-processing mini-computers," he states with considerable irony.

Distorted figures

"Figures can lie, and liars can figure" goes an old saying addressing the problem of distorting figures to prove a point. A market researcher, on the other hand, wants to evaluate the figures in as many ways as possible, trying to flush out anything helpful.

The ease with which that can be done on a personal computer cannot be matched by a large computer, even with its unchallenged statistical capabilities. Once the figures are compiled, they can be easily manipulated with a personal computer. "If we tried to do this stuff on the big computer," says Eichman's assistant,



Vista Makes a Powerful Statement.

Mass storage. Music and video boards. Memory. Whatever you need to make your computer system more powerful and versatile, Vista Computer Company can provide it.

Ask us about disk drive subsystems. We have complete hardware/ software packages for the Apple®, TRS-80™ and S-100 computer systems.

Ask us about advanced components for Apple® computers. We'll describe our Type-Ahead Buffer, Vista Vocalizer, Vision-80 and much more.

Our Products Speak for Themselves.



Ask us about our V-1000, a dual, eight-inch subsystem that combines state-of-the-art technology with state-of-the-art budget pricing.

Ask us about the most innovative peripheral for the Apple®, and we'll give you a complete description of our A800 floppy disk controller.

Ask us for whatever you need to make your particular system fill your particular application. When you supply the questions, we supply the answers.

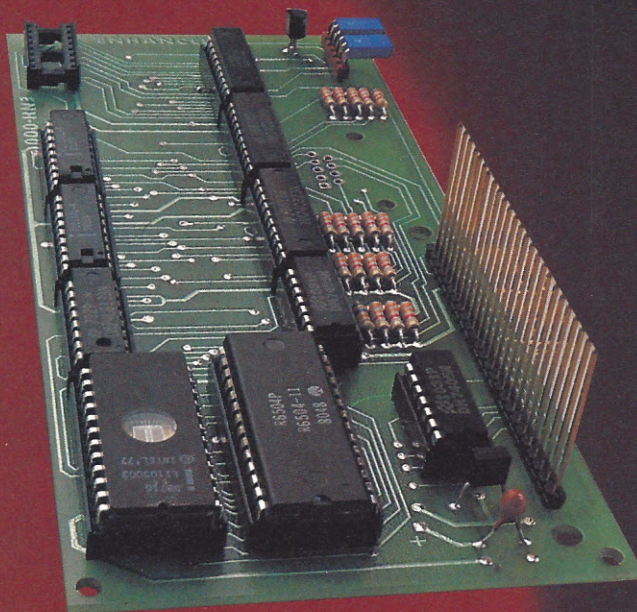
Vista COMPUTER COMPANY
1317 E. Edinger Avenue
Santa Ana, CA 92705
(714) 953-0523

Call Toll Free (800) 854-8017

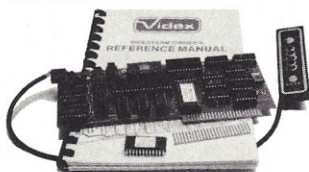
THE DAWN OF A NEW ERA FOR APPLE II: THE ENHANCER II

Introducing the Enhancer II: a new Standard which is improving the relationship between Humans and Apples. The Enhancer II can help your Apple II's keyboard become more sociable by remembering words or phrases which can be entered into the Apple by the mere touch of a key. Life can become even easier because the Enhancer II can remember what you typed while your Apple was busy talking to your disc (or doing other things). Naturally, it knows the difference between upper and lower case letters and what shift keys are supposed to do. It even knows to auto repeat any key held down. The Enhancer II replaces the encoder board making installation simple.

Suggested retail price: \$149.00.



■ VIDEOTERM

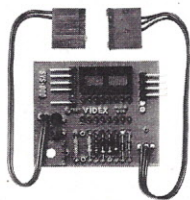


The time tested Videoterm 80 column card:

- 80 characters x 24 lines
 - True decoders
 - 7 x 9 character resolution
 - Low power consumption
 - Compatible with most word processors
 - Softcard and CP/M compatible
 - Modem compatible
 - Most popular character set of any 80 column card
 - Alternate character fonts available
- Suggested retail price \$345.00

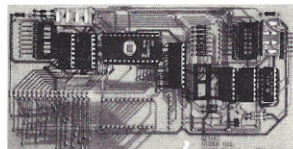
■ SOFT VIDEO SWITCH

The Soft Video Switch is an automatic version of the popular Switch-plate. It knows



whether it should display 40 or 80 columns or Apple graphics. It does the tedious work of switching video-out signals so you don't have to. The Soft Video Switch can be controlled by software. Any Videoterm with Firmware 2.0 or greater may be used with the Soft Video Switch. The single wire shift mod is also supported. Package price is \$35.00.

■ KEYBOARD AND DISPLAY ENHANCER



The original Keyboard and Display Enhancer is still available for Revision 0-6 Apples (on which the new Enhancer II will not fit). These Apples have memory select sockets at chip locations D1, E1 & F1. The Keyboard and Display Enhancer allows entry and display of upper & lower case letters with fully functional shift keys. It does NOT have user definable keys nor a type ahead buffer. The price is \$129.00.

■ ACCESSORIES:

Videoterm Utilities Disc \$37.00 (includes)

- Font Editor
- Pascal Mid-Res Graphics
- Applesoft Read Screen Utility
- Top & Bottom Scrolling
- Pascal Vidpatch
- Graphics Template

Character Set EPROMs \$29.00 ea

- Half Intensity
- Inverse
- German
- Katakana (Japanese)
- Line Drawing Graphics (Expanded)
- Spanish
- French
- Math & Greek Symbols
- Super & Subscript

Dvorak EPROM (Enhancer) \$29.00
Lower Case Chip \$29.00

EDUCATIONAL COMPUTING

Teach your trainees by computer

When we think of educational uses for personal computers, we automatically think of the schoolroom. But not any more. Small computers can now be used for training employees, too

People engaged in a small business are probably not as aware of one fact as are those in large corporations: It's very expensive to keep training people.

This isn't seen in small companies because the costs associated with the training aren't readily measurable. In smaller organizations, people are generally trained on-the-job. They learn by doing the work that they will be doing once they're fully trained. In other words, they learn by making mistakes and correcting their errors. The cost of those errors is measurable only if there is a way to account for the time needed to correct the errors, or if there is a measurement of the efficiency lost through the employee's errors. In many cases, neither measurement capability exists.

It's really only in large companies that training costs are easily measured. These organizations have formal training programs wherein costs are budgeted, carefully watched and controlled. These organizations find that their training costs are high. The costs include the cost of maintaining instructors, the cost of keeping real estate dedicated to training facilities and the cost of maintaining in-

structional aids such as audio-visual equipment.

Is it any wonder, then, that large organizations are turning to non-traditional means to try to increase the efficiency of, and reduce the cost of, the training process? One of those means is the personal computer.

"Even someone who has no prior experience with computers can sit down with the system and be creating instructional materials in a matter of about 10 minutes."

Salute and compute

The U.S. Army provides a case in point. This organization is constantly training to accomplish its mission—winning a war. And this training goes on at enormous cost, for in this organization, there are costs associated with training other than those encountered in civilian firms. Tank-gunners training, for example, in-



MICRO-SCI SQUEEZES MORE OUT OF YOUR COMPUTER, NOT YOUR POCKET

If you own an Apple II* or plan to buy one, consider this:

The Disk II* subsystem made for your Apple II provides only 35 tracks of storage. But Micro-Sci subsystems made for your Apple II provide up to 70 tracks, without reduced versatility or compatibility.

MORE CAPACITY FOR LESS MONEY

Our A40 system features 40 tracks, whereas our A70 provides 70 tracks and exactly twice the byte capacity of Disk II.

With either Micro-Sci system, you pay a lot less per byte. And with the A40, you could even end up paying considerably less per drive.

COMPATIBILITY TO SPARE

Micro-Sci has achieved this extra storage while maintaining compatibility with your existing Apple formatted diskettes.

Our subsystems operate with DOS 3.2 and 3.3, Pascal, and the Z80 SoftCard.

VERSATILITY PLUS

You can even mix Apple Disk II's, A40's and A70's on the same computer. Micro-Sci's controller supports one or two A40's, one or two A70's or one of each.

Single or dual A40 drive subsystems give you more capacity (20,000 to 40,000 bytes) than Disk II drives, for less money.

Micro-Sci's A40/A70 subsystem combines the diskette level compatibility and interchangeability of the A40 with the superior storage capacity of the A70.

Dual A70's provide over half-a-megabyte of storage, at 5¼" floppy prices!

No matter which Micro-Sci subsystem you choose, you'll have more capacity, compatibility and versatility for your computer—and more money in your pocket. Contact us today for more information and the name of your nearest Micro-Sci Dealer.

*"Disk II" is a registered trademark of Apple Computer, Inc., Cupertino, CA.

*"SoftCard" is a registered trademark of Micro-Soft Consumer Products.

μ-SCI

MICRO-SCI

17742 Irvine Boulevard, Suite 205, Tustin, California 92680 / Phone: 714/731-9461 / Telex: 910-346-6739

MICRO-SCI IS A DIVISION OF STANDUN CONTROLS, INC.

CIRCLE 34

cludes the cost of fuel to get the tanks moving, to say nothing of the cost of the ammunition that is destroyed in the training process.

So the Army is investigating the use of modified video-arcade games to accomplish some gunnery training. The costs mentioned could clearly be eliminated in any training in which such games were used.

The business world

There are at least two systems in the commercial world that can aid in training employees in corporations. One of them is a multimedia system from Bell and Howell Audio-Visual Products Division in Chicago. The other is a software system from Micro-Lab in Highland Park, Ill.

The former is presently being used in large corporations like General Motors and Standard Oil of California. (More about those companies' successes in future issues of *Personal Computing*.) The latter is a relatively new system, and thus far its use has been confined to traditional educational institutions. But its generality means it could be applied to other learning situations, like employee training.

Bell and Howell's PASS (Professional Authoring Software System) is designed to incorporate specific subject content and to integrate video tapes or other audio-visuals as appropriate. The system runs on Apple computers. After an instructor has completed the particular program of instruction, copies of the disk on which the program is recorded are made and distributed to the instructor and to the students. The student can then proceed at his own pace, and the system will branch into review or more advanced work—depending on the students' success with current study assignments.

Since the trainee is able to move at his own pace, "The net effect is akin to the viewer's being able to fully control the content, speed and presen-

tation of a television detective show according to how he responds to the clues that are presented in that show," says Bruce Frisch, vice-president of marketing for the Bell and Howell Division. That's because, Frisch notes, the system allows companies that use it to incorporate video situations that correspond to actual corporate situations, whether the tapes are previously available in the company or they are made up specifically for the PASS system. In either case, "The sole determinant of how the program proceeds is the learner's ability and comprehension," says Frisch.

He claims that the system is much lower in cost than those computer-assisted training systems that have been used in the past. Many of these systems are prepackaged systems that feature training modules in certain fixed activities like record-keeping, the operation of generic-plant designs, running of resource-

training session for the day is complete, the personal computer at the heart of the training system can be used for other functions, at no additional cost.

Meanwhile. . .

Almost as versatile, although somewhat more limited, is the Learning System from Micro Lab, a small company in Highland Park, Ill. Deborah Mihm, a company spokeswoman, says the learning system has gained quite a following in the educational community, although not as yet in the training community.

The Learning System has a structure similar to that of PASS. The instructor can write his teaching program himself, using materials that are completely of his design. Students can then use the program in one of two modes—instructional or test.

In the instructional mode, the student is led through the lesson, which consists of questions preceded by

"Large organizations are turning to non-traditional means to try to increase the efficiency of, and reduce the cost of, the training process. One of those means is the personal computer."

allocation models and the like. How well such existing systems lend themselves to individualized-program development varies.

And besides that problem (in the industrial world anyway) most of the systems run on large mainframe computers, and are accessed through time-sharing terminals. Frisch estimates that this can cost over \$100,000 just for the specialized programming and equipment needed for the training implementation.

In contrast, PASS leases for \$5000 per year. The hardware needed to run PASS costs about \$4000. After the

compositions that contain the main teaching points to be covered in the lesson. Students read the compositions, and then answer the questions pertaining to them. The system prompts and helps the students during the course of the lesson. When the student feels he is ready to be tested on the material, he can take a test, written by the instructor and tailored to the needs of the trainee.

Tests are of three possible types—multiple choice, fill-in-the blanks or column-matching. The tests are written on the system master disk, along with the answers. Then the test,

minus the answers, is recorded on a test disk. When students are ready to take a test, the testing action is initiated for the student through the use of a player disk. This disk loads the test to be taken into memory, along with sufficient programs to load and

result in a more creative training program.

Both PASS and the Learning System allow this benefit. In fact, Mihm claims that the Learning System is so simple to use that students can even take the system home with them and

that he was doing extremely well, and wondered if the student had his book open. This caused some consternation, since that was what was happening—the student was cheating in a learning exercise. Presumably, that student now has much more respect for a personal computer.)

The Learning System requires an Apple II Plus with 48k of RAM, a monitor and at least one disk drive, although Mihm says that two drives make the system easier to use. If the training group is large, a printer is helpful, she says.

Using a printer, the instructor can print out and copy learning exercises for students' use if the number of students exceeds the number of computers available in the organization. 

"One of the benefits of using personal computers for training is the machines' ability to free the instructor from repetitive tasks. This allows him to move on to tasks that demand an instructor's expertise."

run the test.

The system will record students' scores, but only on the tests. The questions the student answers in the instructional mode are a "free ride." But the recorded answers from the tests allow the instructor to score the tests and to do a certain amount of analysis on the test results as well. Mihm says this capability allows instructors to catch students who have clear remedial problems that must be handled. In addition, the analysis allows instructors to check the characteristics of their tests to see which questions meet good test criteria and which may be suspect. In this way, instructors can refine the tests to get consistently good results.

The system, says Mihm, is completely menu-driven and user-friendly. "Even someone who has no prior experience with computers," she says, "can sit down with the system and be creating instructional materials in a matter of about 10 minutes."

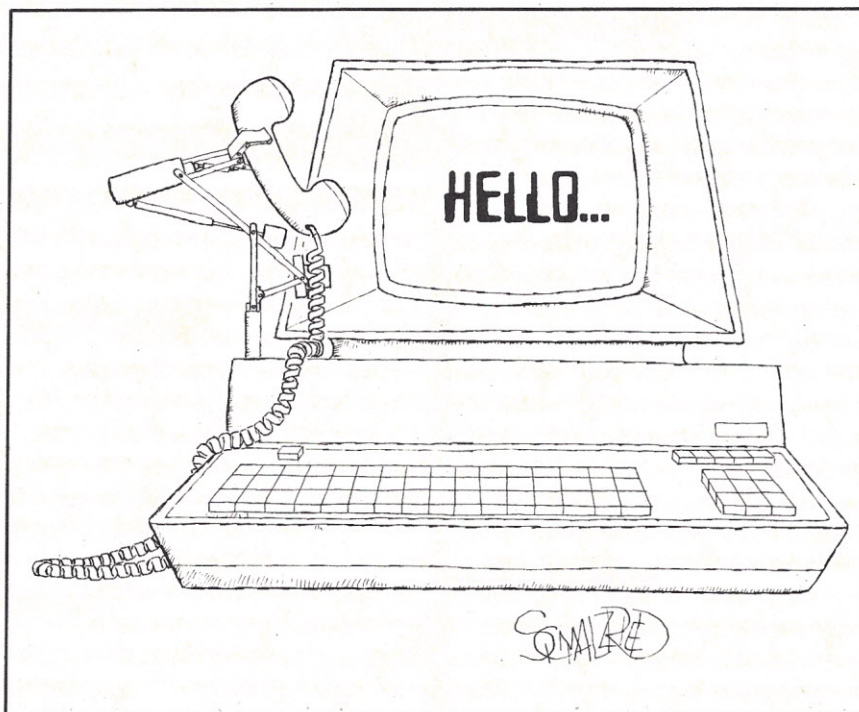
Some free time

One of the benefits of using personal computers for training is the machines' ability to free the instructor from repetitive tasks. This allows him to move on to tasks that demand an instructor's expertise. This should

use it for home-study assignments if those seem appropriate.

While the student is going through the learning exercise, the system can substitute for the teacher in another way—by rewarding the student with praise for correct answers, and gently encouraging him when he makes an error. Mihm says that the Learning System has messages that provide this service as a matter of course. (In one case the system told a student

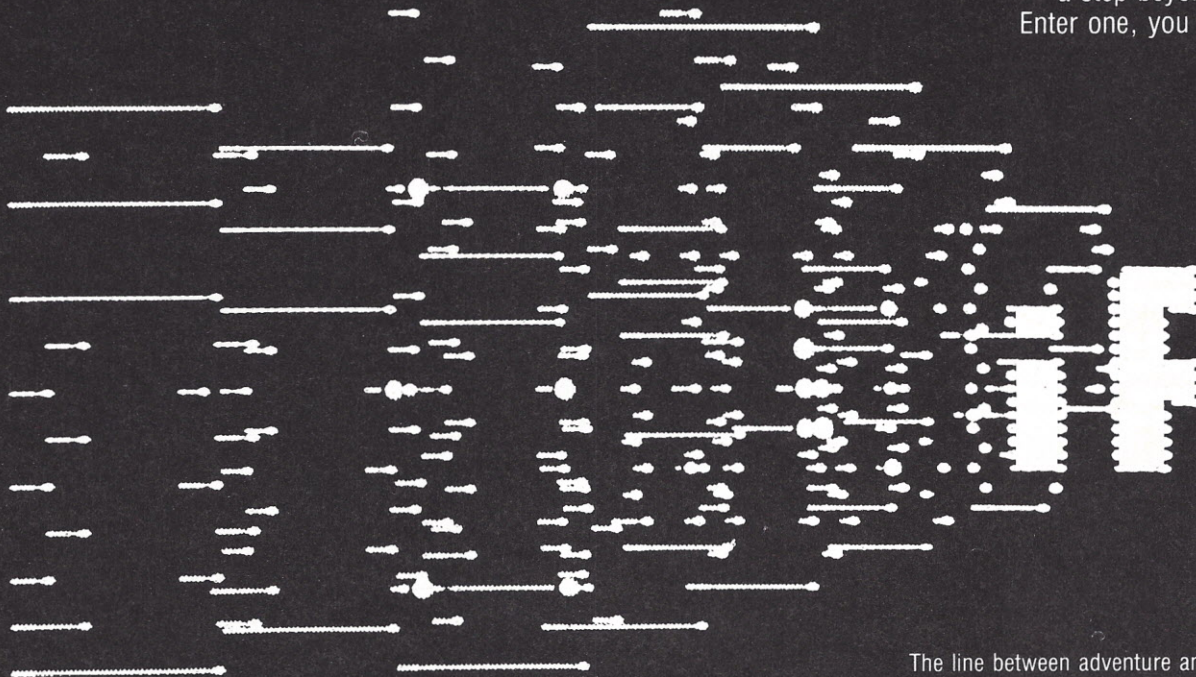
More information about the learning systems can be obtained from Bell & Howell, Audio-Visual Products Division, 7100 McCormick, Chicago, IL 60645; (312) 262-1600 and Micro Lab, 2310 Skokie Valley Rd., Highland Park, IL 60035; (312) 433-7550.



No Adventure More Challenging No Challenge More Realistic No Reality More Frightening

If you're tired of playing juvenile games, **INTERACTIVE FANTASIES (IFs)** are waiting for you.

Each is a classic, an entertainment more sophisticated than most games,
an experience slightly more realistic than you bargained for,
a step beyond the ordinary. . . .
Enter one, you won't want to leave.



the Prisoner

The line between adventure and obsession wears thin when the computer you supposedly control starts playing games with you. **THE PRISONER's** challenge is compelling. In a surreal environment where the simplest clue becomes deception and a riddle may suddenly turn a deadly edge, will you keep your wits? In a bizarre world where your captor smiles sweetly at you, will you remain an individual? In a prison where you may never even find the bars, can you escape?

THE PRISONER, a nightmarish gaming fantasy, was written by David Mullich. Available in Applesoft, 48K, DOS 3.2 or 3.3 \$29.95

EMPIRE I: WORLD BUILDERS™

Miner Hobart accumulated several million credits during the years he spent working the asteroid belts and investing wisely in gambling casinos throughout the galaxy . . . but now uranium poisoning is killing him.

Zora has spread her missionary gospel from one village to the next, manipulating the credulous populace with magic charms and rituals . . . yet now she stands facing the deadly point of a unicorn's horn.

Lazerus Long, stricken with cabin fever while in transit to a distant colony, steps out of the air-lock of his craft into the vacuum of space . . . to meet the Lord of Light.

Who are these intrepid pioneers? Citizens of the **EMPIRE**. Their lives, and the lives of countless others, are yours to experience in **EMPIRE I: WORLD BUILDERS**, where realism goes beyond high-resolution graphics.

EMPIRE I: WORLD BUILDERS™ is the first of a gaming trilogy written by David Mullich. Available in Applesoft, 48K, DOS 3.3 . . . \$32.95

TERRORIST

Face your opponent. Consider your objectives . . . and his. Examine your options . . . and his. Make your move. You may be too late. Act. Now!

TERRORIST does not skirt the issues — whether nuclear blackmail, a jetliner hijacking, or seizure of the World Trade Center. **TERRORIST** simulates these confrontations more accurately than you may have wanted. Your every move is tangled in bureaucratic red tape, randomness, the ambiguities of international politics . . . and the unpredictable behavior of your opponent. You may choose the role of terrorist or authority. But choose; in **TERRORIST** there is no middle ground.

TERRORIST, a two-player game requiring strategy, steel nerves, quick thinking, game control paddles, and Applesoft, 48K, DOS 3.2 or 3.3 \$29.95

At computer stores everywhere.
Dealer inquiries welcome.

 **INTERACTIVE FANTASIES™**

Edu-Ware Services, Inc. •
P.O. Box 22222 • Agoura, CA 91301 • (213) 346-6783
CIRCLE 17

The confidence builder.

Micro-DSS™/FINANCE gives managers the powerful financial software they need. Plus microcomputer convenience and economy.

With Micro-DSS™/FINANCE financial managers can dare to experiment. They can see what would happen if inflation continues at 12% or interest rates drop to 15%. They can ask numerous "what if" questions, consider their options—and confidently support their decisions.

Because for the first time Micro-DSS™/FINANCE gives the microcomputer user the power and features of large computer systems and time-sharing. At a fraction of the cost.

And it gives the potential micro user in both large and small companies a reason to turn to microcomputers—a full scale financial support system that's easy to use, readily available, secure, and flexible. In short, a system that doesn't compromise.

Micro-DSS™/FINANCE features:

- Many built-in financial functions—including depreciation, net present value, internal rate of return and amortization.
- Powerful editing and report writing features that make "what if" analysis and financial reporting easy.
- An automatically generated worksheet with blanks showing where data are needed to calculate the results of the model.
- Built-in graphics with a unique feature—you can retain them for later replay as a "slide show" on the monitor.
- Introductory Guide and User Reference Manual written for people with no computer experience.
- Model can run automatically once it is set up, so a person with no computer skills can run models and reports someone else has created.
- Full user support service

The Apple II Version of Micro-DSS™/FINANCE requiring 48K and Pascal is available now. Suggested retail U.S. price is \$1,500.

For more information (including a list of dealers near you), please write to:



Addison-Wesley Publishing Company
Software Marketing, Dept. O/P87
Reading, Massachusetts 01867

Micro-DSS is a trademark of Addison-Wesley Publishing Company, Inc.

Apple II is a trademark of Apple Computer, Inc.



CIRCLE 18

ADVANCED COMPUTING

High-level languages— which is for you?

Many factors must be considered before you decide on a high-level language. The decision can be made easier by knowing exactly what those factors are

Choosing from among the many high-level programming languages for a personal computer can get to be a bit like a trip through Wonderland with Alice. But knowing the different languages and their applications can eliminate the feeling that you're a stranger in a strange computer world. There is no mystery or magic involved. Familiarity is the key.

Even if you've decided that a language like BASIC is your choice, there's still a selection to be made as to which one. The maker of your per-

sonal computer may not be of much help with this decision. Each manufacturer seems to have extended the language in its own special way—compatibility between different versions of the same high-level language may not exist.

Although this lack of compatibility may make a choice of language difficult, there is a rational way to approach the wide selection. First, you'll have to make some hard decisions that will affect your final choice. Be prepared to go back to square one as you work your way through selecting a high-level language.

Clearing the fog

While it may sound a bit simplistic, the first step in choosing a language is to decide what type of programs you need and who will write them. If your involvement in the software will be minimal, your major choice will be whether or not to use canned or custom programs. If you choose this route, Darshan Singh

Khalsa's guide "Custom vs. canned software: what do you need?" on page 124 of *Personal Computing*, (Octo-



ber 1981) will help you along the way. The high-level language used will be dictated by the canned software or the programmer you select.

Once you've decided what types of programs you need, be they scientific, business or games, then the hardware must be factored into your decision. If you haven't yet purchased a personal computer, then you'll have a large selection of high-level languages from which to choose. If you already have a system, the range of high-level languages available will have some limits.

Non-languages

For some applications, the use of a non-language should be considered. These non-languages are special-purpose commands used in canned

Other non-languages are the electronic spreadsheets available for personal computers. These programs allow the entry and manipulation of data in a tabular format. They are especially useful for finding the answers to numerical questions inherent in sales forecasting.

Commands specific to the package let a user run "what if" tests and manipulations on the data. If the spreadsheet contains sales data, a user can find out how an increase in overhead, like a 10 percent increase in rent, would affect the profit on a month-by-month basis for a whole year.

Program generators are also non-languages. These are generally menu driven. A user answers a set of questions like how big the address field for a customer order file will be, or how

Even if the programmer doesn't meet all of your special needs, it helps block out programs. Many users have found that what they thought was an "absolute necessity" when planning a set of computer programs, proved to be of little or no use six months and many dollars later.

You should thus consider alternatives like a DBMS or an electronic spreadsheet before deciding to go the custom route for programming. You may find that a high-level language isn't really what you need. After all, the bottom line for any personal computer system is finding a solution to a problem, and not how the solution is accomplished.

The Tower of Babel

The number of high-level programming languages is overwhelming. There is COBOL, PL/I, BASIC, Dyna, Lisp, Neliac, Snobol, LOGO, Forth, Small Talk, Jovial, Flap and others. These represent usable languages for different kinds of computers, but the range of usable languages for personal computers is limited.

BASIC (Beginner's All Purpose Symbolic Instruction Code), is widespread on personal computers and it comes in many forms. The most common form is BASIC in ROM written by Microsoft. It's available on several personal computer, including the Apple, TRS-80, Commodore Pet/CBM and Ohio Scientific computers. Disk-based versions of BASIC also abound.

FORTTRAN (FORmula TRANslation) is not as common on personal computers. This language is designed for scientific and engineering calculations (number crunching).

COBOL (COMMON Business Oriented Language) is another available language, but it's not often used on personal computers. It's the most commonly used high-level language for large computers for business-applications programs.

"Once you've decided what types of programs you need, be they scientific, business or games, the hardware must be factored into your decision. If you haven't yet purchased a personal computer, you'll have a large selection of high-level languages from which to choose."

packages like a DBMS (Data-Base Management System). Rather than write a program in a high-level language like COBOL, the user writes a series of commands, or answers a series of questions. This list then drives the canned program in a series of pre-programmed operations.

As an example, a DBMS is really a program that allows the user to store and retrieve data from a series of files. One can set up a DBMS to handle a mailing list. When starting the program, the user defines the size and types of files needed for the names and addresses. These data, after entry into the data base, can then be sorted, changed and printed.

the file data need to be sorted. The program generator then puts together a series of canned routines, such as a sort routine and a formatted printer driver, into a complete custom program.

Personal computer program-generator packages are relatively new. Some require that the user do some cleanup of the generated code, but for a fast-and-easy method of writing custom applications programs, these could be very useful. You should consider one of these packages if you have a working knowledge of programming and don't have the time or the desire to write a special-use program.

Radio Shack - The Leader in Small Business Computers Also Has Computers for Your Home!

Introducing the Lowest-Cost Color Disk System Ever--

Radio Shack's TRS-80®

Radio Shack now offers disk drives for our popular TRS-80 Color Computer. Now you can have superb high-resolution color graphics and fast, "on-line" access to large amounts of data.

Only \$1198 for a 1-Drive System. Our new \$599 disk drive makes our TRS-80 Color Computer—complete with 16,000 characters (16K) of internal memory and Extended Color BASIC language—a versatile, low-cost computing system that's ready to attach to your own TV receiver.

Stores 156,000 Characters! Just plug in the Program Pak™ controller to add disk storage to the Color Computer. The Disk Operating System is completely contained in the Program Pak, so you get a full 156K-bytes of on-line storage. The Program Pak also includes Color Disk BASIC—an enhanced version of the Color Computer's programming language.

Easy to Use. The 16K TRS-80 Color Computer lets you create sophisticated color diagrams, business charts and even simple animation—using just a few simple one-line commands! This gives experienced programmers **incredible power**, yet makes it easy for

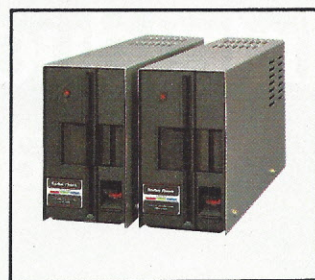
beginners, too. We take you from the ground up with over 500 pages of easy-to-read documentation.

Instant Fun and Games. And just for fun, you can also use any of our plug-in game cartridges. Battle starships in outer space, conquer dinosaurs from a prehistoric world, or just brush up on your chess.

Expandable, too. Your TRS-80 Color Computer Disk System can expand with up to four drives for over 626,000 characters of storage! And the additional drives are only \$399 each. Add up to 16K more memory, a printer and other accessories anytime.

Radio Shack's TRS-80—The Best-Supported Microcomputer in the World!

TRS-80 computers are backed with a wide selection of accessories, software, and service, available at over 6100 Radio Shack stores and dealers, and 185 Computer Centers nationwide. Stop by and see what's really new in personal computers today!



Radio Shack®

The biggest name in little computers™

A DIVISION OF TANDY CORPORATION

Retail prices may vary at individual stores and dealers

To learn even more about the TRS-80 Color Disk System send for the Free New RSC-6 Computer Catalog.

Radio Shack, Dept. 82-A-414
1300 One Tandy Center
Fort Worth, Texas 76102

NAME _____
STREET _____
CITY _____ STATE _____
ZIP _____ PHONE _____

Next to keeping all your data on Verbatim Datalife™ flexible disks, the best thing you can do for your computer or word processor is to keep it running clean and error-free.

And the way to do just that is with Verbatim's new Datalife Head Cleaning Kit. It can remove up to 90% of the debris contaminating your drive heads. Dust, dirt and debris that causes data loss and errors, hinders system performance.

Quick and easy to use

All you have to do is remove a Cleaning Disk from its protective pouch, put the disk in the special jacket, insert it into your drive and turn it on.

In just 30-60 seconds, your drive heads are cleaned.

Cleaning, with no cleaning mess

With your Datalife Head Cleaning Kit there's no hit-and-miss applying solvents that can splash and spill.

What's more, with Datalife Cleaning Disks every time you clean your heads, you can do it with a fresh, clean, disposable disk.

Cleans both Single and Dual Head Drives Safely

There's no worry about damaging your system with Datalife Cleaning Disks. And you can use them on single or dual head drives.

Protect your investment

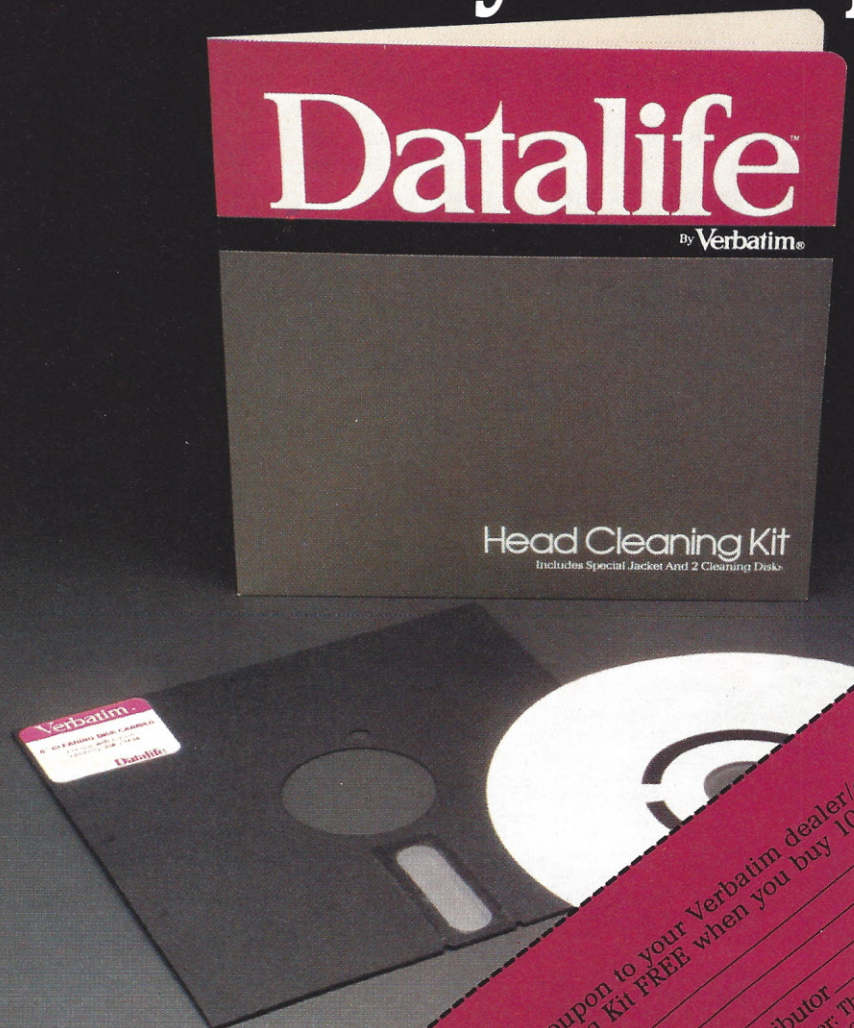
The Datalife Head Cleaning Kit will help you guard against data loss, errors, and degradation of system performance because of debris contamination.

So if you want your data back verbatim, keep it on Verbatim disks. And keep your disk drives clean with Verbatim's Datalife Head Cleaning Kit.

Call (800) 538-1793 for the name of your nearest Verbatim dealer. (In California and outside the U.S. call (408) 737-7771 collect.)

Verbatim®

Introducing the second best thing you can do for your computer.



Take this coupon to your Verbatim dealer/distributor and Get a Datalife™ Head Cleaning Kit FREE when you buy 10 Datalife Head Cleaning Disks.

Name _____ Zip _____
Address _____ State _____
City _____ Dealer/Distributor _____

To the Consumer: This coupon good only on required purchase of specified product. Cash value 1/20 cent. Void where prohibited.
To Seller: Verbatim Corporation authorizes you to accept this coupon for redemption. We will reimburse you in accordance with our Cleaning Disk Promotion Plan 10/1/81. A copy of the Promotion is available from Verbatim Corporation or any authorized Verbatim distributor. One coupon per customer. Offer expires 1/29/82.

Pascal (named after Blaise Pascal, the 17th-century mathematician), is a relatively new high-level programming language used most often in the academic community. Although it is called a high-level language, Pascal is really a programming environment. The package contains both a high-level language and an operating system.

Forth (originally Fourth, for fourth-generation, but the early IBM computer on which it was first programmed only allowed a five-letter file name), is another example of a programming environment. Forth is unique in that it can be extended by the user.

As an example, a tiny Pascal interpreter has been programmed in Forth. The language was originally developed for real-time control applications, but has found a secure niche in the engineering community.

Ada (named after The Countess of Lovelace, the first programmer), is the latest high-level language to be boosted by the Department of Defense. It's intended as a common language for all DOD applications, including business-type programming and automatic-test equipment programming.

Functionally, the language is a superset of Pascal. At present, the language is starting to emerge in operational form. Only subsets are available for personal computer use. If future use of Ada is being considered, Pascal is the obvious choice as a starting point.

The high-level "C" programming language retains much of the flavor of assembly language. Within the personal-computer field it's not widely used, but this is changing. C is the primary language for the Unix operating system. As Unix appears on personal computers, the C language will gain much wider use.

Although these high-level languages are probably the most widely used on personal computers, there are

quite a few others. For example, Lisp has been implemented for personal computer use, but languages like Lisp are generally for special use. Unless your applications is out of the ordinary, BASIC, COBOL, FORTRAN, Pascal, Forth and C are the primary palette of the high-level languages from which to choose.

Language implementation

There are several ways that high-level languages are implemented.

uses from 8 to 12 kbytes of memory.

Compiler implementation

Another type of implementation involves compilers. When a high-level language is built around a compiler, the source code is interpreted only once. The compiler then changes the language into machine code and saves it. The compiling process does the parsing and interpretation of the source code "off line." The compiled program then runs as if it were origi-

"Although a lack of compatibility between different versions of a high-level language may make the choice difficult, there is a rational way to approach the wide selection of languages."

The types of implementation in general use are interpreter, compiler and p-code.

An interpreter implementation of a high-level language scans (parses) each line of the program (source) code and then changes (interprets) it into machine code each time it's used. This can be quite slow, particularly with complex program statements.

In general, references of a line of the program by another program line or lines creates another slow down. If the 100th line of the program must branch to the 500th line, the interpreter starts at the beginning and sequentially looks through the entire program until the referenced line is found. This is slow but effective.

An interpreted high-level language must have all of the package available in memory. For a large program this isn't a disadvantage, but if the program is a simple one, like a dedicated control application, then the cost of the memory-space taken up by the unused part of the interpreter can be costly. An interpreter for a high-level language like BASIC generally

nally written in assembly language.

One disadvantage of a compiler system is that each time there is an addition or modification to the program, it must be re-compiled before it runs on the computer. This can be a slow process on a large program, as the compile time can take several minutes.

Another disadvantage is that compilers are generally disk based. If your storage needs are small, in many cases you'll have to add disk drives to the system.

The size of the compiler's run-time package is also a consideration. Many compiler-implemented languages have a standard run-time package of subroutines. These packages generally take up at least 4 kbytes of memory, with many running to 12 kbytes. Only a few compilers add run-time modules as they are used by the program. An example are those modules needed for double-precision arithmetic.

A false code

The third type of implementation

involves p-codes. P-code (pseudo code) was developed to allow portability of programs from one type of computer to another. In the p-code system, typified by UCSD Pascal, the high-level source code is compiled into a pseudo machine code (p-code). This p-code is then interpreted by a module written in assembly language for each type of processor used.

The advantage of the p-code system is that a program written on a 6800-based personal computer can be run on a Z80 machine without change—only the p-code interpreter is processor dependent.

The disadvantage of the p-code system as compared to compiled code is that it has two time delays. It is delayed when it is compiled and then when each program line, now converted to p-code, must be interpreted each time it's run.

Considering these delays, there is a tradeoff involved. The more compact

software is used for the interpreter, p-code conversion and the run-time package.

At least one personal computer, Western Digital's Pascal Micro-engine, uses p-code as its native language. The p-code interpreter is part of the microprocessor's chip set. National Semiconductor has a microprocessor that includes a BASIC interpreter within the chip. Several other companies are rumored to be at work on microprocessor chips that use Forth as the native language.

The BASIC language

The most common implementation of BASIC uses an interpreter system. If you are developing programs, the instant load-and-go of an interpreter system is a big plus. You can write or modify a line of code and test it immediately. The tradeoff is the slower speed of an interpreter as compared to a compiled program.

"For some applications, the use of a non-language should be considered. These non-languages are special-purpose commands used in canned packages like a DBMS."

compiled p-code uses less memory than most straight interpreters. The interpret time for the simplified p-codes is much less than that required to parse and interpret high-level languages implemented as an interpreter.

Although these three types of implementation are the most common, there is another type. Some high-level languages are implemented as a combination of interpreter and compiled p-code. In this approach, the program is written and debugged with the interpreter. When this is completed, the same software package converts the source code to a p-code and saves it on disk. The same

You'll find interpreter BASIC in ROM in many personal computers, including the Commodore PET/CBM, Atari and Apple. Other personal computers used for business applications, like NEC's PC-8000, come with interpreter BASIC in ROM. Some, like the Smoke Signal Broadcasting units, do not. These units use a disk-based BASIC that's loaded into RAM.

The advantage of interpreter BASIC in ROM is that it's up and running when the power is turned on. You don't have to wait for the disk to load. ROM is also considerably less expensive per byte than RAM.

The disadvantage of interpreter

BASIC in ROM is that if there is any bug in the code, it can only be corrected by changing the ROM. This can get expensive, as many versions of BASIC in ROM require up to four ROM chips.

Another disadvantage of ROM-based BASIC, or any other high-level language, is that in most cases a user must call the desired applications programs from disk using the disk operating system (DOS). With a disk-based BASIC, most DOSs let the DOS, BASIC and the applications program load at the same time—the user has only to boot up the system.

Which BASIC?

There are several BASIC packages on the market. The two primary packages are MBASIC (both ROM and disk-based), from Microsoft, and CBASIC from Digital Research. Both are for 8080/Z80 personal computers, and both operate under Digital Research's CP/M operating system.

For the 6502, 6800 and 6809 microprocessors, there are both compiled and interpreter packages for BASIC. BASIC packages for these processors include those from Technical System Consultants (TSC) with packages for the 6800 and 6809, and Microware's 6809 compiler package. Hayden has a compiler for the Apple II that converts Applesoft source code into 6502 machine code. The same selection criteria that apply to MBASIC and CBASIC also apply to high-level languages for these processors.

The ideal BASIC is one that allows program development in the interpreter mode and then compiles the BASIC program into machine code. This combination gives the user a fast method of debugging a program—long waits for a new compile after a minor change aren't needed—and gives a fast-running program for actual applications use.

Everybody's making money selling microcomputers. Somebody's going to make money servicing them.

**New NRI Home Study Course Shows You How to Make Money Servicing, Repairing,
and Programming Personal and Small Business Computers**

Seems like every time you turn around, somebody comes along with a new computer for home or business use. And what's made it all possible is the amazing microprocessor, the tiny little chip that's a computer in itself.

Using this new technology, the industry is offering compact, affordable computers that handle things like payrolls, billing, inventory, and other jobs for businesses of every size...perform household functions including budgeting, environmental systems control, indexing recipes. And thousands of hobbyists are already owners, experimenting and developing their own programs.

Growing Demand for Computer Technicians

This is only one of the growth factors influencing the increasing opportunities for qualified computer technicians. The U.S. Department of Labor projects over a 100% increase in job openings for the decade through 1985. Most of them *new* jobs created by the expanding world of the computer.

Learn at Home in Your Spare Time

NRI can train you for this exciting, rewarding field. Train you at home to service not only microcomputers, but word processors and data terminals, too. Train you at your convenience, with clearly written "bite-size" lessons that you do evenings or weekends, without going to classes or quitting your present job.

Your training is built around the latest model of the world's most popular computer. It's the amazing TRS-80™ Model III, with capabilities and features to perform a host of personal and business functions. No other small computer has so much software available for it, no other is used and relied on by so many people. And it's yours to keep for personal or business use.

You get plenty of practical experience. Using the NRI Discovery Lab® that also comes as part of your course, you build and study circuits ranging from the simplest to the most advanced. You analyse and troubleshoot using the professional Beckman LCD digital multimeter you keep to use later in your work. Then you use the lab and meter to actually access the interior of your computer...build special circuits and write programs to control them. You "see" your computer at work and demonstrate its power.



Become the Complete Computer Person

You're also trained in writing and debugging both BASIC and advanced machine language programs...gain hands-on experience in the operation and application of computers to business and personal jobs. You're trained to become the fully rounded, new breed of technician who can interface with the operational, programming, and service facets of today's computers. You're ready to take your place in the new electronic age.

Other Opportunities

NRI has been giving ambitious people new electronic skills since 1914. Today's offerings also include TV/Audio/Video Systems servicing with training on our exclusive computer-programmable 25" diagonal color TV... Communications Electronics for servicing and installing microwave, broadcast, CB, radar, etc...and other state-of-the-art courses.

Rush coupon for Free Catalog... No Salesman Will Call

Send the coupon for our 100-page catalog showing all courses with equipment and complete lesson plans. There's no obligation other than to yourself. See how NRI can help you grow with the most exciting and important new field of the 80's. If coupon has been removed, please write to NRI Schools, 3939 Wisconsin Ave., Washington, D.C. 20016.



NRI Schools
McGraw-Hill Continuing
Education Center
3939 Wisconsin Avenue
Washington, D.C. 20016

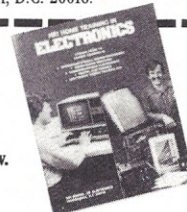
We'll give you tomorrow.

NO SALESMAN WILL CALL.

Please check for one free catalog only.

- ☐ Computer Electronics including Microcomputers
- ☐ Color TV, Audio, and Video System Servicing
- ☐ Electronics Design Technology
- ☐ Digital Electronics
- ☐ Communications Electronics • FCC Licenses • Mobile CB • Aircraft • Marine

- ☐ Basic Electronics
- ☐ Small Engine Servicing
- ☐ Appliance Servicing
- ☐ Automotive Servicing
- ☐ Auto Air Conditioning
- ☐ Air Conditioning, Heating, Refrigeration, & Solar Technology
- ☐ Building Construction



All career courses
approved under GI bill.
☐ Check for details

Name _____ (Please Print) _____ Age _____

Street _____

City/State/Zip _____

Accredited by the Accrediting Commission of the National Home Study Council

173-012

If you already have a personal computer system, and BASIC is selected as your high-level language, then the selection is probably limited. If the computer has Microsoft's BASIC in ROM, the choice of compiler is limited to one that's compatible with that particular BASIC in ROM. For example, Radio Shack's compiler works with its ROM-based BASIC for the TRS-80.

When selecting a BASIC, consider the possible future use of the applications programs. If it's possible that

of the system. A low-cost Pascal package, such as Radio Shack's Tiny Pascal, may be acceptable for the novice programmer. But unless features such as disk-file handling and I/O control are in the package, you'll be very restricted as to the kinds of applications programs you can write.

Another factor to consider with Pascal is the large amount of memory it requires. While some full-featured Pascal packages are quite compact, most require 64 kbytes of RAM—the limit for most low-cost personal

computers. Recently, FORTRAN was generally available only on minicomputers and mainframes, but some FORTRAN packages are now available for personal computers.

One advantage of using FORTRAN is that there are a large number of available stock (library) routines for the language. A user adds these library routines to a program at compile time. In some cases it's only necessary to design the flow of a program and to write a core module that calls the individual library routines.

Also, if you need scientific and engineering calculations, the vast amount of programs available in FORTRAN are a decided asset. This can well offset the \$750 or more that a FORTRAN package with extensive library modules can cost.

One disadvantage of FORTRAN is that it is not interactive—the complete program must be compiled every time a change is made. The passing of variables from one FORTRAN module to another is also quite cumbersome.

If you wish to try FORTRAN, packages for personal computers like the TRS-80 are available for under \$200.

Need a Forth?

Before deciding upon FORTRAN for your applications programs, care must be taken to review other options. One such option is Forth.

Forth is a rather unique language that has gained much favor with engineers. It's the only commonly available personal computer language that can be extended by the user. This makes it an ideal language for process control and custom applications such as graphics.

The Forth language is implemented as an interpreter, but as each line of code is entered, it's compiled. This interactive line at-a-time compiling makes it possible to

continued on page 101

"Commands specific to the electronic spreadsheet package let a user run 'what if' tests and manipulations on the data."

you'll wish to run them on a wide variety of computers, then factor this into the decision-making process.

If you decide on Digital Research's CBASIC, you'll have compatibility with most Z80-based personal computers. If you choose MBASIC, then your programs, within the limits of special disk and video commands, should run on the PET/CBM, Apple, TRS-80 and the Atari. Microsoft's BASIC is also used on some of the Japanese computers that are becoming available on the U.S. market.

A replacement language

In addition to BASIC, another common high-level language is Pascal. Pascal is often touted as the language that will replace BASIC. Pascal's major advantage is that its modular structure forces a programmer to be organized. Also, if you are looking to the future and feel that Ada may be the focus of your programming, Pascal is the obvious place to start.

One problem with Pascal is its cost. As an example, the Apple Pascal package adds about \$500 to the cost

of the system.

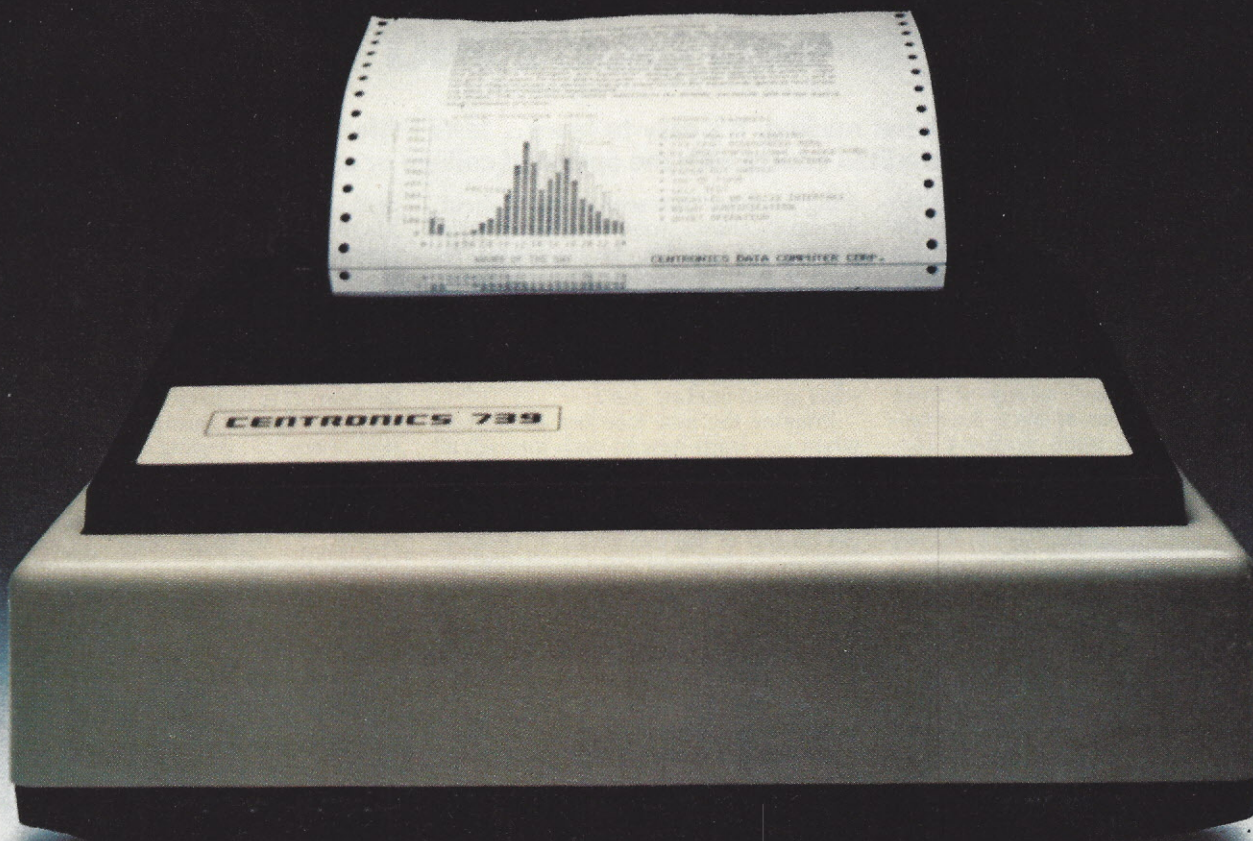
Check to see how much memory is needed by the run-time p-code interpreter. If it's large, and most run at least 24 kbytes or more in size, add the cost of adding more RAM to the system when making the choice.

When considering Pascal as a programming language, note that there are two ways that it has been implemented for personal computers—p-code and native code. Because of the speed limits of the p-code approach, many makers of large computers, like Digital Equipment, implemented Pascal so that the compiler outputs native code (machine code) for a specific microprocessor. The speed and memory requirements must then be considered when choosing which Pascal is right for your computer.

Using FORTRAN

If Pascal is not the right choice for your machine, you might want to consider FORTRAN. This language was developed as an engineering tool for solving complex equations. It is usually in compiler form. Until re-

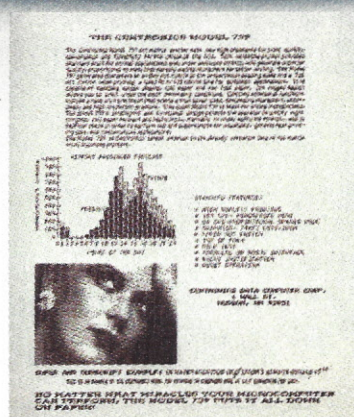
THE CENTRONICS 739. IT'S MORE THAN YOU'D EXPECT FROM AN INEXPENSIVE DESK-TOP PRINTER.



Inexpensive doesn't have to mean incomplete, and the quiet, dependable Centronics 739 is the classic example. It's complete in capability and because it's from Centronics you can expect it to perform just like the workhorse printers that have made Centronics a leader in the business for more than a dozen years. So when you shop for a desk-top printer and compare features, here's what you can expect from a 739:

CORRESPONDENCE QUALITY—Clear, high density characters plus right justification and proportional spacing that produce correspondence, direct mail, and other important documents that demand a "custom" quality appearance.

BUSINESS GRAPHICS—What good is a printer that can't print your technical business/management information? The 739 produces a range of graphics—from bar charts and curves to illustrative material—almost anything your computer can produce.



3-WAY PAPER HANDLING—Cut sheets for correspondence; roll paper for day-to-day operations; fan-folded forms for normal data printout.

DEPENDABILITY—You depend on your printer for hard copy of timely information and that means it must operate dependably. With Centronics reputation behind the 739, reliability is a foregone conclusion. More than 350,000 Centronics printers sold worldwide is the proof.

SERVICE—Someday you may need it. Where do you find it? With Centronics worldwide network of service locations it's not very far. And now, there are authorized Centronics sales and service dealers, and "walk-in" service centers in an expanding number of key cities throughout the U.S.

When it comes to printers, Centronics is the leading independent printer manufacturer—chosen by computer professionals in major industry brand preference studies. So when you look for an inexpensive printer don't settle for incomplete. Choose the Centronics 739. It comes complete with a commitment—to performance, dependability and service. See it at your Centronics dealer. Or write for information.

CENTRONICS® PRINTERS

CIRCLE 122

Centronics Data Computer Corp.
One Wall Street, Hudson, New Hampshire 03051

WHAT'S BETTER THAN SPEED READING?

SPEED LEARNING

(SPEED PLUS COMPREHENSION)

Speed Learning is replacing speed reading. It's easy to learn...lasts a lifetime...applies to everything you read...and is the only accredited course with the option of college or continuing education credits.

Do you have too much to read and too little time to read it? Do you mentally pronounce each word as you read? Do you frequently have to go back and re-read words or whole paragraphs you just finished reading? Do you have trouble concentrating? Do you quickly forget most of what you read?

If you answer "yes" to any of these questions — then here at last is the practical help you've been waiting for. Whether you read for business or pleasure, school or college, you will build exceptional skills from this major breakthrough in effective reading, created by Dr. Russell Stauffer at the University of Delaware.

Not just "speed reading" — but speed reading-thinking-understanding-remembering-and-learning

The new *Speed Learning Program* shows you step-by-proven-step how to increase your reading skill and speed, so you understand more, remember more and use more of everything you read. The typical remark made by the 75,000 slow readers who completed the *Speed Learning Program* was: "Why didn't someone teach me this a long time ago?" They were no longer held back by the lack of skills and poor reading habits. They could read almost as fast as they could think.

What makes Speed Learning so successful?

The new *Speed Learning Program* does not offer you a rehash of the usual eye-exercises, timing devices, costly gadgets you've probably heard about in connection with speed reading courses or even tried and found ineffective.

In just a few spare minutes a day of easy reading and exciting listening, you discover an entirely new way to read and think — a radical departure from any-

thing you have ever seen or heard about. Research shows that reading is 95% *thinking* and only 5% eye movement. Yet most of today's speed reading programs spend their time teaching you rapid eye movement (5% of the problem) and ignore the most important part (95%) *thinking*. In brief, *Speed Learning* gives you what speed reading *can't*.

Imagine the new freedom you'll have when you learn how to dash through all types of reading material *at least* twice as fast as you do now, and with greater comprehension. Think of being able to get on top of the avalanche of newspapers, magazines and correspondence you have to read... finishing a stimulating book and retaining facts and details more clearly and with greater accuracy than ever before.

Listen-and-learn at your own pace

This is a practical, easy-to-learn program that will work for you — no matter how slow a reader you think you are now. The *Speed Learning Program* is scientifically planned to get you started quickly... to help you in spare minutes a day. It brings you a "teacher-on-cassettes" who guides you, instructs, encourages you, explaining material as you

read. Interesting items taken from *Time Magazine*, *Business Week*, *Wall Street Journal*, *Family Circle*, *N.Y. Times* and many others, make the program stimulating, easy and fun... and so much more effective.

Executives, students, professional people, men and women in all walks of life from 15 to 70 have benefited from this program. *Speed Learning* is a fully accredited course... costing only 1/5 the price of less effective speed reading classroom courses. Now you can examine the same, easy, practical and proven methods at home... in spare time... without risking a penny.

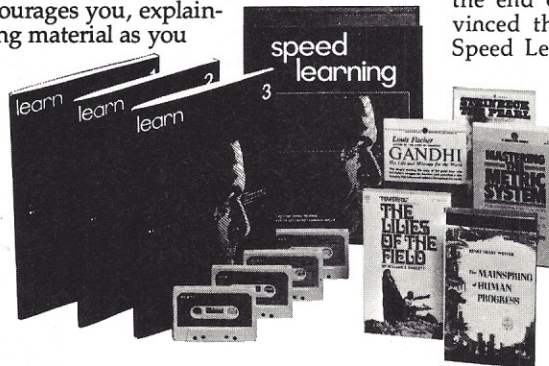
Examine Speed Learning FREE for 15 days

You will be thrilled at how quickly this program will begin to develop new thinking and reading skills. After listening to just one cassette and reading the preface you will quickly see how you can achieve increases in both the speed at which you read and in the amount you understand and remember.

You must be delighted with what you see or you pay nothing. Examine this remarkable program for 15 days. If, at the end of that time you are not convinced that you would like to master *Speed Learning*, simply return the program and owe nothing. See the coupon for low price and convenient credit terms.

Note: Many companies and government agencies have tuition assistance plans for employees providing full or partial payment for college credit programs.

In most cases, the entire cost of your *Speed Learning Program* is Tax Deductible.



COLLEGE CREDITS



You may obtain 2 full semester hour credits for course completion, wherever you reside. Credits offered through Whittier College (California). Details included in your program.

CONTINUING EDUCATION UNITS



National Management Association, the world's largest association of professional managers, awards 3.0 CEU's for course completion. CEU's can be applied toward the certificate in Management Studies.

PROFESSIONAL SOCIETIES

Speed Learning is offered internationally to members of professional associations such as: American Chemical Society, Foundation for Accounting Education, Institute of Electrical and Electronics Engineers and dozens more. Consult your Education Director for information.

BUSINESS, INDUSTRY, GOVERNMENT

Many companies and government agencies offer *Speed Learning* as a wholly-paid or tuition reimbursement program. Consult your Training or Personnel Director for details.

learn
INCORPORATED

113 Gaither Drive, Mt. Laurel, NJ 08054

PCOM-1

YES! Please rush me the materials checked below:

- ☐ Please send the *Speed Learning* program @ \$99.95 plus \$4 postage and handling.
- ☐ Please send the *Speed Learning Medical Edition* @ \$109.95 plus \$4 postage and handling.
- ☐ Please send the *Junior Speed Learning* program (ages 11 to 16) @ \$89.95 plus \$4 postage and handling.

NJ residents add 5% sales tax.

Check method of payment below:

- ☐ Check or money order enclosed (payable to learn incorporated)
- ☐ Charge my credit card under the regular payment terms
 - ☐ Visa ☐ Master Card ☐ Interbank No. ☐ American Express

Card No. _____ Exp. Date _____

I understand that if after 15 days I am not delighted in every way, that I may return the materials in their original condition for a full refund. No questions asked.

Name _____

Address _____

City _____ State _____ Zip _____

Signature _____

If you don't already own a cassette player, you may order this Deluxe Cassette Recorder for only \$49.95. (Includes handling and delivery.)

Check here to order ☐



— Outside USA add \$10 per item—Airmail extra —

Gain instant access to over 1,200 information and communication services for as little as \$4.25 an hour.

They're all at your fingertips when you join The Source,SM America's Information Utility.

The Source can improve your efficiency, speed your work, and reduce expenses in your organization by giving you access to personal and business services that run the gamut. From electronic mail and discount buying services to stock reports and hotel reservations. And in most cases, you can reach The Source with a local phone call using any standard microcomputer, communicating word processor, or data terminal.

SourceMailSM...faster than U.S. Mail, cheaper than most long distance calls.

SourceMail is an electronic mail system that lets you send messages to other Source subscribers, anywhere in the country. Use it to communicate with your field offices or traveling sales representatives. Create your own network to clients, associates, outlets or suppliers. Store information for later retrieval when needed. The Source can even correct spelling errors.

Best of all, communicating through The Source can be cheaper than any other method...including long-distance phone, Telex, facsimile, express mail, or messenger.

Streamline your business operations.

Just feed The Source your figures and it will calculate your taxes, cash flows, equity capital, lease vs. equipment purchase, loan amortizations, annual interest rate on installment loans, depreciation schedules. Use its Model 1 service for financial planning, simulation, and analysis.

You can use The Source's powerful mainframe computers to write and store your own programs, with computer languages like BASIC, COBOL, FORTRAN, RPG11 and assembly language. Naturally, we give you a private access code so your programs and data inputs are secure.

Your electronic travel agent.

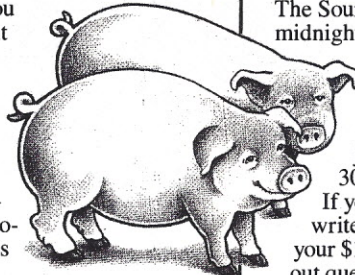
Plan your trips with instant national and international flight schedule information. Use The Source Travel ClubSM to arrange airline tickets, rent a car, and make hotel reservations. Use The Source to check the weather ahead or find



the best place to eat using our electronic Mobil Restaurant Guide.

Instant access to the stock market.

Whatever your investments — stocks, bonds, mutual funds, T-bills, commodities, futures or others — The Source will give you updated investment information 22 hours a day. We go beyond mere market quotes to add economic, business, and financial commentary by noted economists and securities analysts.



Get news, hot off the UPI wire.

Around the world or around the corner, find out about the latest news straight from United Press International. You can select only the news, business reports, sports or features you want...geographically, by date, or subject matter. Get the latest update within 2½ minutes of a filed report, or go back to earlier coverage.



That's just the beginning.

There's so much more. The Source has an electronic personnel search network. It lets you barter your goods and services with other businesses. Orders hard-to-find technical and business books direct from the publisher. Gives you a daily review of Washington activities. Lets you order thousands of business and consumer items at discount prices. Maintains your stock portfolio. And we're improving and adding to our subscriber services every day.

Anyone can use The Source.

You don't have to know computer languages or have programming skills. The Source operates on simple, logical English commands. It comes with a complete user's manual, categorized directory, and private sign-on codes.

The Source isn't limited to your office. You can access it from home, or on the road, 22 hours a day. Use it to catch up with office work, or for self-improvement and family fun. The Source will play bridge with you, coach your children in foreign languages, help select dinner wines, give you the latest movie reviews, and more. It's amazingly versatile.

The value with the guarantee.

For all the communications and information services, you pay only a \$100, one-time subscription fee and \$18 per hour during the business day when you are actually using it. From 6 P.M. to midnight and on weekends and holidays The Source is just \$5.75 an hour. From midnight to 7 A.M. the rate drops to \$4.25. Minimum monthly usage charge is only \$10.

What's more, we're so sure you'll find The Source just what you need, we offer a 30-day money-back guarantee. If you're not completely satisfied, write us and cancel. We'll refund your \$100 hookup fee in full, without question. You pay only for time actually used.

See your computer dealer, mail coupon, or call for free brochure.

To learn more about THE SOURCE, visit one of the more than 800 independent computer stores that offer THE SOURCE. Or get our free 16-page color brochure and index of over 1,200 Source services now by mailing the coupon or calling toll-free 1-800-323-1718 (In Ill. call 1-800-942-8881) and ask for Operator 91.

Find out how much THE SOURCE can do for you.

THE SOURCE
AMERICA'S INFORMATION UTILITY

Department M40
1616 Anderson Road
McLean, VA 22102

Please send me your free 16-page color brochure without obligation.

(name) (Please Print)

(telephone)

(Company if for business use)

(address)

(city/state/zip)

Do you own a microcomputer, terminal or communicating word processor?

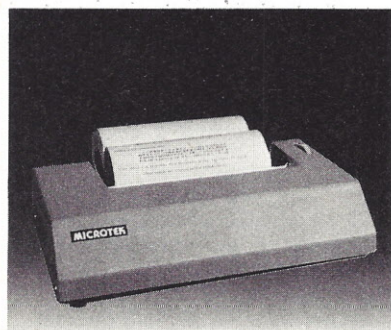
If yes: (make/model)

The Source is a servicemark of Source Telecomputing Corporation, a subsidiary of The Reader's Digest Association, Inc.

NEW PRINTERS. NEW PERIPHERALS. SAME OLD RELIABLE QUALITY AND VALUE.

1982 will find more OEM's, businesses, dealers and personal computer users turning to MICROTEK than ever before.

TekWriter-1



80 Column Dot Matrix Printer (Formerly BYTEWRITER-1)

The Tekwriter-1 printer is, dollar for dollar, the finest value in the industry. And we've proved it by comparing the Tekwriter-1 to the Epson MX-80. Our print speed is 14 lines per minute faster, our life expectancy is longer, the character sets are the same, and the interface, warranty and printhead replacement cost are all identical.* But the biggest difference is the price. The Tekwriter-1 is about \$300 less.

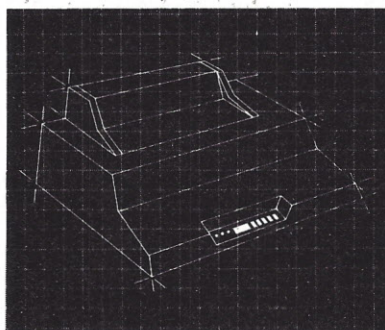
Our extensive testing has proved that the Tekwriter-1 interfaces problem-free to the TRS-80, the Apple II and the Atari 400 and 800.

The Tekwriter-1 is tough to beat for performance and quality.

*Data Source: Epson MX-80 Operation Manual

\$349

TekWriter-2



NEW! 80/132 Column Dot Matrix Printer

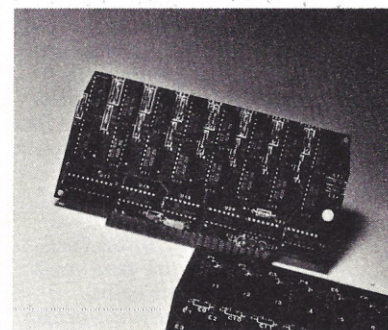
The Tekwriter-2 is perfectly suited to personal, business or OEM applications. Tekwriter-2 is designed to accept single sheet, roll or pin feed paper. It has a 9-wire dot matrix impact print head which produces crisp characters and has underlining capability. The printer is manufactured to run extremely quietly even while operating at peak output levels.

Tekwriter-2 is especially well suited to handle an abundance of text entry because of its data buffer expansion capability to 25K. This ability makes it an efficient graphics generator.

Parallel interface (Centronics type). Interfaces all models of TRS-80, Apple, and Atari 400/800, and most computers with Centronics printer interface.

\$695

Peripherals



16K Memory Board, AMB-16

16K 4116 RAM (200NS)
• Assembled and tested • No modifications — hardware or software • Compatible with Atari 800

32K Memory Board, AMB-32

32K 4116 RAM (200NS) • Assembled and tested • No modifications — hardware or software • Compatible with Atari 400/800

Atari (RS-232) Serial Printer Cable

Pre-tested • 3' length • DB15 to DB25 connectors

Atari Parallel Printer Cable

Pre-tested • 3' length • Centronics compatible • DB15 to Amphenol 57-30360

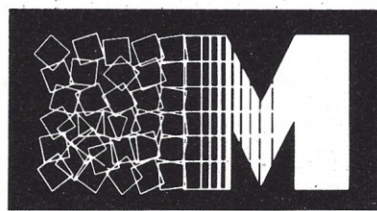
16K Apple Memory Card

Expands Apple II to 64K RAM memory. Works with MICROSOFT Z-80 Softcard, Apple PASCAL and Visicalc software.

Quantity and OEM discounts available.

Continuing our quest for excellence.

TRS-80 is a trademark of Radio Shack, Inc.
Apple II is a trademark of Apple Computer, Inc.
Atari 400/800 are trademarks of Atari, Inc.
Microsoft is a trademark of Microsoft Consumer Products, Inc.
Z-80 is a trademark of Zilog, Inc.
Visicalc is a trademark of Personal Software, Inc.



MICROTEK Inc.

CIRCLE 23

MICROTEK
9514 Chesapeake Drive
San Diego, CA 92123
(714) 278-0633
Outside CA call
Toll Free (800) 854-1081
TWX. 910-335-1269

HOME COMPUTING

Energy analysis for effective consumption

Solar architects are turning to personal computers to formulate critical answers to pressing problems

During the past decade, solar energy has wavered between being the darling and the black sheep of the energy world. And although once seen as the savior that would end the United States' appetite for imported oil, its stock foundered a

few years ago—a victim of government budget crunching, energy-industry apathy and infighting over what a solar home should look like.

Active units, passive units, pumped collectors—just the whisper of these terms in a room full of architects five years ago in Colorado or California set off a rash of scurrying to briefcases for each to produce their unquestionable personal design of the ultimate in solar architecture.

Simple is beautiful

Much of that is over. With the end of large-scale government funding, solar supporters—forced to go it alone now—have taken a more sober look at the home designs available to collect their favorite energy source.



PHOTO BY STEVE SAGALA

HOME COMPUTING

They've concluded that simpler is far more beautiful.

Ironically, while the personal computer as an invention is arguably one of the most complex that humans have devised, solar architects appear to be on the threshold of adopting it to enhance some of their most uncomplicated designs and to improve their ability to create these designs. These architects feel that the personal computer is easing solar energy's transformation from an exotic form

of heating to a credible energy source.

In solar architecture the movement from active to passive systems has been a conscious effort to avoid the mechanical failures that could turn an economical home into a money eater.

Active units were rushed on the scene in the early 1970s during the first sharp blows of the oil crisis. Simply, as the name "active" implies, they are a labyrinth of moving

parts—pumps, valves and switches—connected to the solar rooftop heat collectors. All this boiler-like machinery is intended to drive the heat through the house.

But too often the solar mechanisms clunked and ground to a halt just when the wind and cold began to swirl outside. Moreover, while possibly lowering the consumption of oil by a few gallons, massive amounts of electricity were being used to power the sun's free heat through the

TABLE 1
SUNDAY VERSION 4.1
BUILDING LOAD SIMULATION PROGRAM

STATION:	YAKIMA
LATITUDE:	46.50
RUN DESCRIPTION:	DIRECT GAIN OPTIMALLY INSULATED BUILDING
TOTAL HEAT LOSS RATE:	230.00 BTU/HR*F
LOW SET POINT TEMPERATURE:	68.0 F
HIGH SET POINT TEMPERATURE:	76.0 F
NIGHT SET BACK TEMPERATURE:	60.0 F
NIGHT SET BACK HOURS:	8
HOURLY APPLIANCE HEAT GAIN:	2000.0 BTU/HR
APPLIANCE BALANCE POINT TEMPERATURE:	56.6 F
NON-REFLECTED PERCENTAGE OF TRANSMITTED/ABSORBED RADIATION:	95%
TOTAL WINDOW AREA:	150.0 SQFT
NUMBER OF GLAZINGS:	TRIPLE GLAZED
WINDOW ORIENTATION:	S - 100.0, E - 20.0, N - 30.0
BEGINNING OF SEASONAL SHADING:	MAY
ENDING OF SEASONAL SHADING:	SEPT
SOLAR HEAT GAIN FACTOR (SHADING):	0.40
HEAT STORAGE:	13000.0 BTU/F

MONTH	SET-POINT HEATING LOAD	APPLIANCE BAL-POINT LOAD	ACTUAL HEATING LOAD	COOLING LOAD	USEFUL SOLAR GAIN	USEFUL APPL GAIN	FRACT USEFUL SOLAR	FRACT USEFUL APPL
1000's BTU								
JAN	6785.	5297.	4204.	0.	1093.	1488.	0.95	1.00
FEB	4770.	3426.	1598.	0.	1828.	1344.	0.92	1.00
MAR	4692.	3204.	794.	30.	2410.	1488.	0.86	1.00
APR	3206.	1834.	151.	286.	1682.	1372.	0.63	0.95
MAY	1637.	622.	34.	218.	588.	1015.	0.57	0.68
JUNE	771.	180.	0.	654.	180.	591.	0.18	0.41
JULY	463.	89.	0.	1513.	89.	373.	0.08	0.25
AUG	580.	110.	0.	1450.	110.	470.	0.09	0.32
SEPT	1424.	527.	0.	425.	527.	897.	0.41	0.62
OCT	3015.	1625.	121.	621.	1505.	1389.	0.55	0.93
NOV	4576.	3140.	1617.	0.	1523.	1436.	0.92	1.00
DEC	6330.	4842.	3702.	0.	1140.	1488.	1.01	1.00
TOTAL	38250.	24898.	12221.	5196.	12677.	13352.	0.64	0.76

© 1981 DAVIS STRAUB AND LARRY PALMITER
ECOTOPE GROUP, 2328 EAST MADISON, SEATTLE WA 98112 (206) 322-3753

home so that the cost savings became negligible.

Raising questions

From the failures of active systems, passive units emerged. Passive solar homes are built to merely welcome the sun's energy, trap it in a thermal mass such as masonry in the floors and walls, and reradiate it as heat through louvered vents or with low-energy fans.

For an architect, designing a passive unit means facing a spate of questions and balancing as many tradeoffs. For instance, how much insulation is necessary to cover the home's requirements? Is more glass needed on the south side? Is it better to build a well-insulated building with small windows, or to have large windows and greater heat-storage inside?

Exploring possibilities

"For the first time we have a tool that lets the architect do this kind of exploration," says David Straub, a former researcher for the U.S. Department of Agriculture, "and at zero cost if they already have a personal computer."

The tool is called SUNDAY, a program that simulates the heating requirements of a building, based on such factors as compass orientation, window glass area and thermostat settings. Straub and an associate, Larry Palmiter, a former director of passive solar research at the National Center for Appropriate Technology in Montana, developed SUNDAY at the Ecotope Group in Seattle, a consulting firm for architects and construction engineers.

"The basic idea behind simulating heating requirements is not new," Straub adds. "There have been models for active solar systems in Europe since the 1970s. What is new about SUNDAY is that it is the first simulation for passive solar systems—for the building as a whole. SUNDAY is a tool that will run fast,

for very little cost, and still give reasonably accurate results."

SUNDAY is unique in both its passive solar orientation and the fact that it's a personal computer-based program. In many ways it comes out of work already done by one of its creators.

Sophisticated programs

Palmiter, who was the contractor on the first 10 passive solar houses built in New Mexico, has specialized in detailed thermal modeling of buildings. He is the author of a very sophisticated computer program called SUNCAT, which uses hourly weather data and up to 100 inputs from walls or floors, sampling them as often as 10 times every hour.

Calculating the solar heat when model building requires that SUNCAT make and store millions of computations. Since joining Ecotope last year, Palmiter has written a proprietary version of SUNCAT, called SUNCODE, and both of these require a minicomputer to run.

"People don't realize how slow a personal computer is compared to a mini," says Palmiter. "To do all the calculations for a full annual run on SUNCODE—with floating-point arithmetic—takes six minutes on a DEC PDP-10 minicomputer; about 10 hours on a 16-bit, single-board personal computer; and over 30 hours on an 8-bit Z80 running at 4 MHz." To laymen, this means that minicomputers can juggle larger numbers, and more of them, faster than smaller computers can.

Fast and easy

SUNDAY is a lot simpler than SUNCODE, using only daily weather measurements and much fewer sample points on the building. "Compared to SUNCODE," says Straub, "SUNDAY is grossly simplified, but it's fast and easy to use so that you can explore many possibilities. The SUNDAY figures are

within one or two percent of the daily SUNCODE analysis, where heat is the significant factor."

According to Straub and Palmiter, SUNDAY is useful for simulating the heating and cooling requirements of residential and light commercial buildings. "Larger buildings generate a lot more heat," says Palmiter, and are therefore less sensitive to the impact of solar energy on their outside walls.

SUNDAY is a typical personal-computer program in that it prompts the user to enter relevant data, one item at a time. The user types in the orientation of the building, the glass area, the temperatures at which a thermostat will switch the heat on and off (set points), the expected contribution of appliances—and people—to the internal heat and the months when trees or awnings will shade the windows. That takes a few minutes. The calculations themselves take only about ten seconds, during which time SUNDAY reads weather data previously stored in the computer's memory. The results appear in table 1.

Increasing complexity

"When we wanted to design a simulation package for personal computers, we couldn't just cut back SUNCODE," Straub says. "We had to start by asking 'What is the least amount of information I need to accurately predict a building's heating load?' We increased the complexity of the SUNDAY simulation until we came close to the results that SUNCODE produces."

Straub says that they settled on five main energy use factors and identified their sources. The heat-loss rate and the heat-storage capacity are calculations made by the architect or builder, based on construction materials and window glazing. Similarly, the architect determines the building's orientation and the square

continued on page 93

KNOWLEDGE IS POWER

True when Sir Francis Bacon said it in 1597 at the dawn of the scientific age. And true a thousand times over in 1946, when the brilliant mathematician John Von Neumann supplied the key idea—the stored program—that made possible the modern computer.

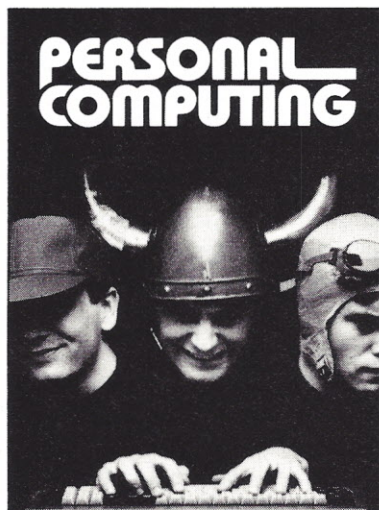
Today the age of the micro-computer is upon us and individuals *personally* own machines vastly more powerful than Von Neumann's. Personal Computing, the hallmark of the 21st century. And for the readers of PERSONAL COMPUTING magazine, the 21st century has already begun.

Doctors, dentists, lawyers, retail merchants, parents, teachers, investors, inventors, salesmen, scientists, engineers, artists, designers, small businessmen, personal estate managers—PERSONAL COMPUTING subscribers all. Some started before they bought computers and then used our no-nonsense reviews and articles to decide whether and which for all their subsequent purchases. Others bought their computers first and then turned to us for the up-to-the-minute, accurate information they needed to get the most from their machines.

Profit, convenience, entertainment, education, our readers' interests run the gamut. But they share a common insight. They've discovered a tool that amplifies the power of their own minds. From us they expect—and get—articles to help them master and use that tool, articles like these:

- Are systems prices going to come tumbling down?
- The current balance sheet on small business software.

- Your data processing department manager's real opinion of your personal computer.
- Custom software is required—sometimes.
- Computer literacy—a right or a privilege?
- Inventory Control: One of the Toughest (But Most Useful) Jobs for a Personal Computer.
- Goodbye Passive T.V., Hello Active Learning.
- Self-writing programs can solve the software crisis.
- The ultimate fantasy—simulation games make it.
- Re-learning work habits to fit the executive work station.



Increase Your Power

Personal computing is growing with dizzying speed—over one million users now, over ten million by 1985. Ten million people with enormous power at their fingertips, but they won't all be equal. The ones getting the most from the computer revolution will be the ones who've subscribed to PERSONAL COMPUTING the longest. Don't delay. Don't miss out. The future won't wait. Call or send for your no-risk trial subscription today!

PERSONAL POWER

YES, enter my subscription to PERSONAL COMPUTING at the special introductory rate of \$9.97 for 12 issues—a discount of over 44% off the regular price. I understand I reserve the right to cancel my subscription any time, for any reason, and receive a refund for the full amount I've paid.

☐ Payment Enclosed ☐ Bill Me Later

Charge my ☐ MasterCard ☐ VISA ☐ American Express

Account Number _____

Card Expiration Date _____

MasterCard Number _____
(4 digits above name)

Name _____

Address _____

City _____

State _____ Zip _____

Your first issue will arrive in 6-8 weeks.

PERSONAL COMPUTING, 4 DISK DRIVE, BOX 1408, RIVERTON, N.J. 08077

Right for the time. Finally someone invented an RS-232C compatible calendar/clock system, complete with 6-digit display... and selling for only \$249. Hayes did it!

Introducing the Hayes Stack Chronograph, the newest addition to the Hayes Stack microcomputer component series. It allows your computer to accurately record all of your system activities by date and time... down to the second. Thanks to a battery back-up system, you never have to reset the time when your computer is off, and it will keep on ticking even when there's a power failure. A write-protect switch prevents accidental

Hayes Stack™

Microcomputer Component Systems

changing of day, date or time.

Right for the job. The Hayes Stack Chronograph is ideal for any home or business application requiring accurate timekeeping. Use it for timing everything from lights, burglar alarms, or sprinkler systems... to sending mail electronically (with the Hayes Stack auto-dial Smartmodem and your computer)... logging and recording reports or time-sharing access time...

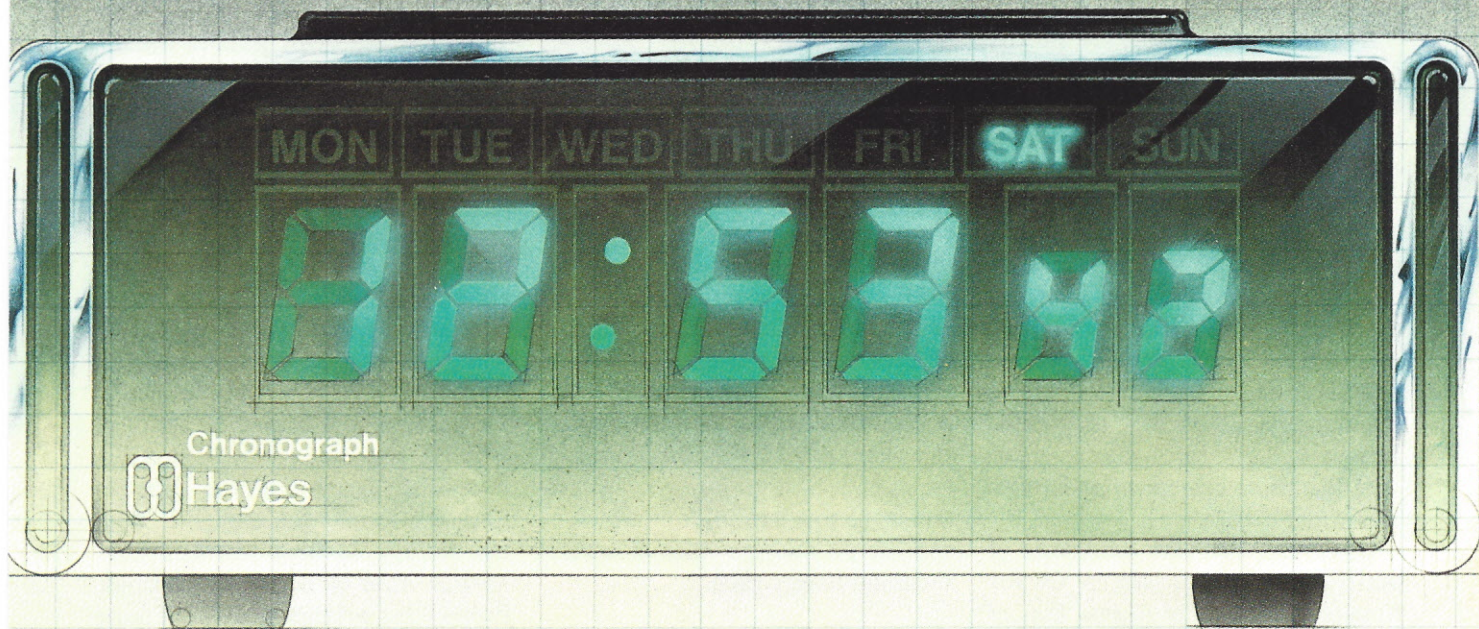
and batching all your messages to send at night, when rates are lowest. Chronograph helps do it all.

And Chronograph stacks up. Keep your computer system up-to-date with the Hayes stackables, including the RS-232C compatible Smartmodem, the most sophisticated 300-baud originate/answer modem you can buy. And yet, it's probably the easiest to use too.

The Hayes Stack Chronograph and Smartmodem are available wherever fine computer products are sold. It's time. And it's now.



The Hayes Stack Chronograph.
There's no better time.



Hayes Microcomputer Products, Inc. 5835 Peachtree Corners East, Norcross, Georgia 30092 404/449-8791

Hayes Stack is a trademark of Hayes Microcomputer Products, Inc. © Hayes Microcomputer Products, Inc.

BUSINESS COMPUTING

Mailing-list packages—a mainstay for business

Here are 18 mailing-list packages that can help you keep abreast of your sales, clients and target markets

Mailing-list packages don't have to be expensive to perform the needed functions. They don't have to be hard to use. They don't even have to be difficult to find. There are many flexible, versatile and powerful mailing-list packages available that you can learn to use in hours, if not minutes, and these can cost as little as \$50.

During the early years of the personal-computer revolution, mailing-list applications were touted as one of the main ways consumers could use computers.

While consumers failed to respond to the mailing-list software, small- and medium-sized businesses caught on fast, especially those that depended heavily on office workers and promotional sales. Businesses that had never before been able to afford mailing lists found that they could now make large sales, stay in touch with clients or customers and target their markets.

One man who took advantage of mailing-list programs is Oliver Emmert, president of Alpha, Etc., of Shelby, N.C. This fabric distributor has tripled the size of his mailing list with Galactic's Mass/Mail Subscription System (on the 64k TRS-80 Model II with a DataSouth 180 cps line printer) from 3000 to 9000 names. His staff sends out 500 to 600

sales brochures each day with no problems at all.

Most important to Emmert is the package's coding system. Using six select codes, each customer is coded by geographic region and by account type such as yarn, hobby goods and needlecraft goods. The system allows Alpha to very closely target each type of customer with the right type of sales brochure.

"I have seen a marked improvement in the results from our mailings. We can send out more brochures more frequently and stay on top of the account maintenance much better. We can even include a coded history for new and prospective customers when we establish their record in the system," says Emmert.

Emmert has experienced no serious problems with software bugs, and he says that he and his staff had no problems learning the system. It has worked so well that he is outgrowing the software's 10,500-record capacity, so he'll have to buy another system or go to a hard disk on which he can set up multiple files of several thousand names each.

Features to consider

What makes mailing-list software good? How can you tell a package that fits your requirements from one that does not? The first feature to consider is capacity. Many packages, like the Radio Shack Mailing List II,

have a small total-system capacity. Radio Shack's limits are 3000 names using smaller-than-normal fields in each record.

This type of package is system-bound; no matter what you do, the software cannot handle more than its stated capacity. Even Stonehenge Computer's 30,000-record system using the Corvus hard disk is system-bound.

Other packages are simply disk-bound. These can handle an unlimited number of records, limited only by the number they can hold on each disk. Each must also allow transfer of file names and records among disks.

The second feature to consider is the format and the number of lines allowed in each program. There are two basic format types: fixed- and free-form. Fixed means that the fields (or lines) are already defined in the package and cannot be changed without significant modifications. Free-form means that the user defines the format for each list. Both the Prodigy Mailing List and Easy Mailer have a free-form format. Prodigy has a large array with more than 100 user-definable categories and Easy Mailer has a small form letter/ mailing system.

In addition to these two basic formats there are combinations and variations. The Synergistic Software package gives you a choice of three

MORE BANG FOREVER

Forever is a long time and that's what Qantex Printers are designed to do, print for a long time. The new Qantex Impact Printers are perfect for applications where crisp copy is needed fast, reliably and at a modest cost.

The new feature packed Model 6010 incorporates a 2K or a 4K message buffer capable of accepting up to two full CRT screens of data. . . Switch selectable forms length from 3 to 22 inches in .5 inch increments. . . Switch selectable vertical tabbing, 4 or 6 lines. . . Horizontal tabs at columns 1, 9, 17, 25, etc. . . Adjustable tractors accept paper sizes from 3 to 15 inches, front or bottom feed. . . Multiple communications protocols accomodate parallel or up to 19,200 baud serial interfaces supporting RS-232, X-ON, X-OFF or current loop. . .

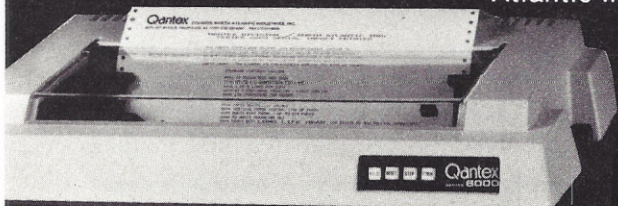
Other advanced features included at no additional cost include a sleek human factors engineered enclosure incorporating a low noise sound cover. . . Exceptionally high reliability resulting from simple mechanical and electronic design. . . 500 million character print head. . . High quality original plus up to five sharp copies. . . Beautiful 96 character set stored in the microprocessor in a 9 x 9 dot matrix. . . True lower case descenders and underlining. . . Bi-directional logic seeking. . . Built-in self test 150 characters per second. . . 80/136 columns per line. . . Available now!

For more information about the new Model 6010 contact your local distributor!

Qantex*

Division of North Atlantic
60 Plant Avenue
Hauppauge, NY 11788
(800) 645-5292 (516) 582-6060
TWX (510) 227-9660

*Registered Trademark of North Atlantic Industries, Inc.



ARIZONA The Phoenix Group Inc.	(602) 967-1421
ARKANSAS Harvey Electronics	(501) 224-0899
CALIFORNIA Basic Systems Corp. Basic Systems Corp. Basic Systems Corp.	(213) 673-4300 (714) 268-8000 (408) 727-1800
ILLINOIS Electro Tech Marketing Engineered Sales	(312) 588-4535 (312) 832-8425
LOUISIANA Micro Computer of New Orleans	(504) 885-5883
MARYLAND Systems International Inc.	(301) 977-0100
MASSACHUSETTS S & S Electronics, Inc.	(617) 458-4100
MINNESOTA Vikeland Sales	(612) 645-4647
MISSOURI ESC Sales & Leasing	(314) 997-1515
NEW YORK Daily Business Products, Inc.	(516) 543-6100 (800) 645-5556 (212) 594-8065
Straitline Marketing Inc. Synchro Sound Enterprises Washington Electric Co.	(212) 445-4225 (516) 484-1852 (212) 226-2121 (800) 221-5416
PENNSYLVANIA QED Electronics	(215) 674-9600
TEXAS Datanet Inc.	(214) 669-1758
VIRGINIA Nine Associates, Inc.	(703) 273-1803
AUSTRALIA Mitsui Computer Systems	02-9299921
CANADA Computer Markets	416-445-1978
DENMARK T.M.S. System I/S	(45) 02-840784
ENGLAND Northamber Limited	(44) 372-67646
FRANCE Gepsi	(33) 1-554-9742
GERMANY Technitron	49 (89) 692-4141
HONG KONG Hong Kong Equipment Computerworld Ltd.	3-444216-8 5-440033
ITALY Eltron	39 (30) 55026
NETHERLANDS Computdata Benelux B.V.	31-73-422045
PORTUGAL Decada Equipamentos de Electronica Lda	351-19-558609
REPUBLIC OF CHINA Microcontrol Corp.	(02) 703-1842
SINGAPORE General Engineers Assoc. Pte. Ltd.	2729412
SPAIN 2i Ingeniera Informatica	204-2099
VENEZUELA Sysgen Data	02-719455

DISTRIBUTORS INQUIRIES INVITED

fixed-forms. Others such as Dr. Daley's package include default formats, but allow users to redefine the layout if they choose. A few programs also include several comment or code lines into which various types of information can be placed. This information can include telephone numbers, sales figures or personal information.

When deciding which program best fits your needs, it is also important to study their sort and search functions. Combined with the format layout, these determine how flexible and versatile the system can be.

You may be both pleased and dismayed by the variety of sort and search functions inventive programmers have included in mailing-list packages. The two simplest types are zip code and alphabetical searches. More advanced programs such as Micro Business Systems Mail List include up to 100 user-defined categories and up to 10 user-defined types of sort headings. With the same package, you can sort by any of the five standard fields including business name, street number, street name, city, state and zip code.

A number of other packages sort by number or alphanumeric codes as well as (or instead of) either name or zip code sorts and searches. At least two of these are flexible. Software Sorcery has a function that prints all of the records that match any of the characters in a six-character code. If you tell the program to print all entries with A***BC, it will print any record with A in the first position, B in the fifth position and C in the sixth position (A111BC, ADEFBC, A999BC, etc.) Dr. Daley's package has the same function with more searching capability and calls it Group Search.

A few packages will sort and/or search by more than one field at a time. Micro Computer Industries' Create-A-Base uses a simple six-step process to sort by two fields at the

same time. The same package allows sorting by any of 10 fields. Several other packages allow you to sort/search or print by various codes or groups of codes.

For example, DYNACOMP uses a code line of up to 21 keywords made of three characters each. You can input a code of AAA to mean that the company in the record is a preferred customer, a code of BBB to indicate a credit limit of \$10,000 or a code of CCC to show that the customer is a garment manufacturer. It's up to you to design your own codes and keep them straight.

More than just mailing

These types of coding and the inclusion of comment lines, telephone numbers and other information not directly related to a mailing address make these packages potentially powerful data-base management tools. Prodigy's mailing package is basically a powerful information-management system with a different name.

Non-address information lines in these packages store useful information. When you can also sort, search and print with them, they allow you to precisely select target audiences for anything you wish to mail. Peachtree, for example, has external and select codes. The former is used for ID, social security, telephone, account or employee numbers. The latter can be divided into as many as 12 yes/no categories of 12 interest areas which you define.

The first character could define sex; the second, age by category (21-29 might be the letter A); the third, income (the number 1 could stand for an income between \$5000 and \$10,000); the fourth, (the letter B for a product interest such as baby clothes); and so on. A select code of FA1B would then indicate that this person is a female between the age of 21 and 29 with an income of between \$5000 and \$10,000, who is interested

in buying baby clothes. You could easily determine that you might not sell \$100 satin baby sheets to this person, but you might sell \$5 booties.

This application can also be used by businessmen who wish to target those customers who are most likely to buy certain products and not others. They can save money by printing fewer, shorter and more specialized solicitations, and by sending fewer letters to "non-customers."

This allows a user to do the highly sophisticated direct-mail solicitations that only large organizations could afford in the past. Arming small-businesses with sophisticated marketing techniques is another of the dozens of ways that personal computers battle the industrial giants which have more money and marketing muscle.

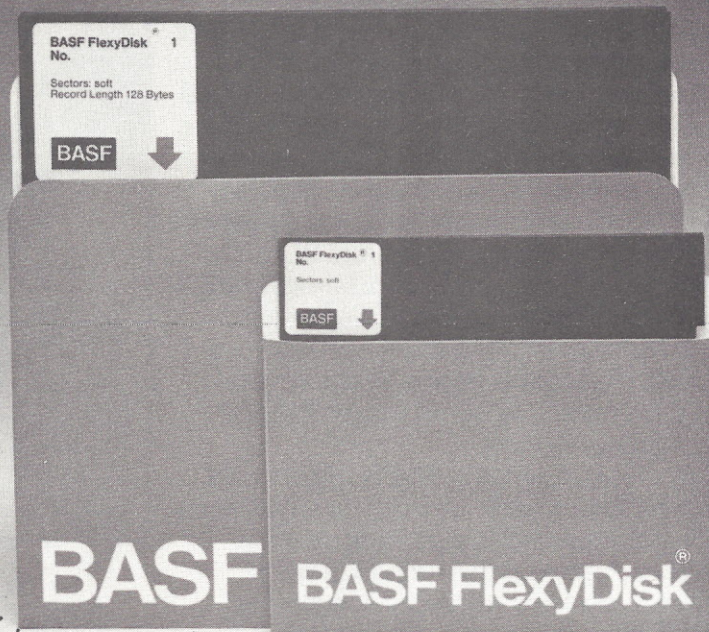
Increased capability

Another option available to mailing-list users is a package that merges mailing addresses with form letters. If your business frequently corresponds with individuals on the mail list, or if you want your clients or customers to get "originals" of form letters, solicitations, collection or subscription renewals or inquiries, you may need this capability.

As James Hunt, an industrial distributor notes, not every industry or business needs form letters to get its point across. The Missionary Baptist Seminary in Little Rock, Ark., uses the Corvus hard disk-based Stonehenge Computer package for its follow-up to requests for literature, sales leads, new product information and monthly specials. The seminary then sends these requests to religious bookstores and individuals, according to Jerry Baldwin, an Apple dealer who installed the seminary's system.

"The seminary mails newsletter subscriptions twice a month. It has about 6000 names on its current list. It keeps track of all subscriptions and renewals and prepares these mailing

Ten reasons why your floppy disk should be a BASF FlexyDisk®.



More than four decades of experience in magnetic media—BASF invented magnetic recording tape, the forerunner of today's wide range of magnetic media, back in 1934, and was the first independent manufacturer of IBM-compatible floppy disks.

Tough Tyvek sleeve—no paper dust, no static electricity.

Special self-cleaning jacket and liner help eliminate data errors and media wear and tear.

Packaging to suit your requirements—standard flip-top box, Cassette 10® storage case, or bulk pack.

Center hole diameter punched to more accurate standards than industry specifications, for top performance.

100% certification—every single disk is tested at thresholds 2-3 times higher than system requirements, to be 100% error-free.

Bi-axially oriented polyester substrate—for uniform and reliable performance year after year.

For the name of your nearest supplier, write BASF Systems, Crosby Drive, Bedford, MA 01730, or call 617-271-4030.

Cross-linked oxide coating—for low head wear and long trouble-free media life.

Total capability—one of two manufacturers in the world that makes both 8" and 5.25" models, has tape and disk experience, and manufactures floppy disk drives.

Double lubrication—lubricants both in the formula and on the disk surface, to minimize media wear due to head friction.



BASF

Floppy Disks Mag Cards Cassettes Computer Tapes Disk Packs Computer Peripherals

CIRCLE 26

INTRODUCING CALCSTAR.TM ANOTHER INDISPENSABLE BUSINESS PROGRAM FROM MICROPRO,TM THE WORDSTARTM PEOPLE.

Presenting CalcStar — another standard-setting software product in the WordStar tradition.

CalcStar is MicroPro's new electronic spread sheet and financial modeling program — a sophisticated, yet easy to use, calculating and planning tool for CP/M[®]-based computers.

The ultimate electronic spread sheet.

CalcStar calculates solutions to complex numerical problems in business and finance. Helps you make budget plans and sales forecasts with greater speed and accuracy. And projects figures into the future to answer the "what if" questions you face in business.

And CalcStar also has a unique MicroPro advantage: It joins with WordStar to combine spread-sheet and word-processing capabilities in several powerful ways.

CalcStar software eliminates the need to use ledger paper ever again. It turns your video screen into a "window" on a giant electronic ledger sheet, with up to 600 entries arranged the way you want. Then, by inserting formulas into CalcStar, you create financial models that simulate the future numerically. And predict the outcomes of your business decisions.

When you notice what CalcStar can do for your business, you'll wonder how you ever got along without it. (If you're now a WordStar user, you probably already know the feeling.)

The MicroPro bonus. Like WordStar, CalcStar is packed with innovative features that make it versatile and easy to use. Features like Automatic Forms Mode, which lets an inexperienced user enter data into a spread sheet quickly and with less chance of error.

CalcStar's greatest innovation is its ability to join with WordStar. Which means, for example, you can use WordStar's printing options, like boldface and underlining, to dress up financial documents. And you can insert sections of CalcStar's spread sheets into your WordStar documents.

This kind of flexibility should come as no surprise if you're already familiar with the MicroPro software family — a line of programs designed to work together to multiply your problem-solving power. Visit your MicroPro dealer to find out just how big a difference *all* our products can make in your business. We predict you'll discover it's not just CalcStar or WordStar that's indispensable. It's MicroPro.



A glance at CalcStar features

Runs on CP/M version 2.0 or above, with 80-column screen, addressable cursor, and at least 48K memory. 56K or more is recommended for fullest utilization.

Highly user friendly: Call up full screen of help or use help menu. WordStar-like cursor commands. User's guide shows you the basics. Install from menu OR a WordStar file.

Stores formulas and formats along with data, for convenience and less chance of error.

Math functions include average, minimum, maximum, logarithms, exponents, and regression analysis.

SOFTWARE
THAT MEANS BUSINESS

MicroProTM

INTERNATIONAL CORPORATION

1299 Fourth Street, San Rafael, California 94901
(415) 457-8990; Telex: 340-388

CP/M is a trademark of Digital Research, Inc.
Dealer and distributor inquiries invited.



MAILING LIST BUYERS' GUIDE

COMPANY	NAME/COST	CONFIGURATION/CAPACITY
Apple Computer 10260 Bantley Dr. Cupertino, CA 95014 (408) 996-1010	APPLEPOST \$49.95	Apple II 48k, two drives; Qume or Centronics printer; Max. capacity: 30,000 on six drives, 6000 on two; DOS 3.2.1.
	Apple III Mail List Manager Price not announced.	128k Apple III, one extra drive; Qume Sprint 5 or Silentype III printers; Max. cap. 960 records per diskette, unlimited diskettes, but two extra drives required.
Charles Mann & Assoc. Micro Software Division 55722 Santa Fe Trail Yucca Valley, CA 92284	Master Mailing List \$99.95	Part of both Master Text Processor and Docuwriter Text Processor packages; Apple II Plus, 48k; AppleSoft in ROM; Capacity: 300 records per file, unlimited files.
Computer House Division F.L.C., Inc. 1407 Clinton Road Jackson, MI 49202 (517) 782-2132	Mailing List \$80	32k Commodore 2001, 4032 or 8032 computer; CBM Dual Disk Drive 2040, 4040 or 8050; Tractor-Feed Parallel Printer. Capacity: 500 names per disk.
D.B. Software 11840 NE Brazee Portland, OR 97220 (503) 255-7735	Mailing Lister \$59.95	TRS-80 Model I and II 32k, one disk drive, any OS with RS Microsoft BASIC Level II; Small capacity.
Dr. Daley's Software Water St. Darby, MT 59829 (406) 821-3924	The Mail List V4.8 \$179.95 V4.4 \$159.95	Version 4.8 runs on CBM 8032 computer with 8050 disk; Version 4.44 on CBM 4032 or 8032 computer with 4040 disk. Capacity: V4.8 = 4,164 records per disk; V4.4 = 1,345 records per disk. 80 disks per file and unlimited files.
DYNACOMP 1427 Monroe Ave. Rochester, NY 14618 (716) 442-8960	Mail List Release 2.2 \$34.95	48k Apple II, 48k Atari 800, 56k North Star Horizon and CP/M systems; one or two disk drives; printer. Min. capacity: 1100 records per single density diskette.
Galactic Software 11520 N. Port Washington Rd. Mequon, WI 53902	Mass/Mail Subscription System \$299.95	TRS-80 Model II, 64k; one or more drives; TRSDOS 2.0 or later version; 80- or 132-column line printer. Max. capacity: 10,500 records on 3 drives.
	Mail/File System Model I \$99.95 Model II \$199.95	32k TRS-80 Model I, or 64k Model II, with one or more disk drives, line printer. Capacities: Model I up to 600 records per diskette; Model II up to 2500 records per disk.
Information Unlimited Software 281 Arlington Ave. Berkeley, CA 94707 (415) 525-9452	EasyMailer \$69.95	48k Apple II, II Plus, or Pascal System; At least one disk drive; 13- or 16-sector; DOS 3.3; printer with interface card. Capacity: related to size of fields and records compared to disk capacity in bytes.
Micro Business Systems 7725 Broadway Suite B Merrillville, IN 46410 (219) 769-3445	Mail List \$150	64k TRS-80 Model II; CP/M OS; 132-column printer; at least one 8-in. drive. Max. capacity: 14,500 with four drives, or 2500 with one drive.
Micro Computer Industries 1520 East Mulberry Fort Collins, CO 80524 (303) 221-1955	Create-A-Base \$100	CBM 8032/8096 32k; 4040 or 8050 dual disk drives; CBM 2022 or 2023, NEC Spinwriter 5530, Mannesmann Tally 8024 printers. Capacity: 999 records per diskette
North Star Computer 14440 Catalina St. San Leandro, CA 94577 (415) 357-8500	Mail Manager	56k North Star Horizon; at least two double density or quad density disk drives; printer. Capacity: From 376 records to 3010, depending on number and type of drives.
Peachtree Software Retail Sciences Three Corporate Square Suite 700 Atlanta, GA 30329 (404) 325-8533	Mailing List/ Mailing Address \$295	Apple II 48k, or any 48k CP/M 8080, 8085 or Z80-based systems; 80- to 132-column printer; two disk drives; Microsoft BASIC. Capacity: 1200-1500 records per disk.
Prodigy Systems 497 Lincoln Highway Iselin, NJ 08830 (201) 283-2000	Mailing List System (part of system price)	Prodigy System, 64k Z80 based, IBM standard 8-in. floppies; PROTEGE OS. Capacity limited only by disk capacity, unlimited files.
Radio Shack Computer Merchandising P.O. Box 2910 Fort Worth, TX 76102	Mailing List II \$299	TRS-80 Model II, 64k, 1-4 disk drives, 132-column printer, TRSDOS 2.0a OS. Capacity: 3000 maximum.
Software Sorcery 7927 Jones Branch Dr. Suite 400 McLean, VA 22102 (703) 385-2944	Mailing List \$49.95	Apple II with AppleSoft ROM or Language Card, or II Plus, Apple II disk subsystem with at least one drive, and a com- patible printer. Capacity: 500 records per diskette.
Stonehenge Computer 89 Summit Ave. Summit, NJ 07901 (201) 277-1020	Commercial Mailer \$250	48k Apple II Plus, 80- or 132-column printer, Corvus 11AP Hard Disk, one 5 1/4-in. disk drive. Capacity: 30,000 names.
Synergistic Software 5221 120th Ave. S.E. Bellevue, WA 98006 (201) 226-3216	Mailing List Database \$50	48k Apple II Plus or Apple II with AppleSoft ROM or Language Card, at least one disk drive. Capacity: 645 records on program disk, and 852 on data disk.

lists," Baldwin says. All of this information doesn't require much "personalized" attention, so a system without form-letter capability, but with a large capacity, was best for the seminary.

A number of good packages that work with word-processing software are also available. These include EasyMailer with EasyWriter, Charles Mann's Master Mail with two of its text editors, Radio Shack's Mailing List II with Scripsit, D.B. Software's Mailing Lister with a form letter you add to the list, Create-A-Base with WordPro and others.

In addition to form-letter and word-processing capability, printing functions should also be considered when purchasing mailing-list software. That is where sorting and special coding functions will be the most useful. Generally, special coding or sorting procedures will only print labels that match their selected criteria. Synergistic, for example, will do a three-field search and produce a printed report limited to sort by state, last name and first name.

Print functions can also have their own characteristics. Most packages let you choose a range of labels to be printed by zip code, code numbers or by last or full names. All of the packages will print every label, but some print in zip code order only, some in code-number order only, some in name order and some in the order the records were entered (sequentially).

Choosing the right mailing-list package for your business requires a careful balancing of your requirements with the features available in each package. These features include package capacity, available lines or fields, formats and flexibility, variety of search and sort functions, form-letter merging, type and variety of printing functions and special miscellaneous functions unique to each package.

continued on page 84



Keep your company ahead of the game. On TARGET.TM

Successful companies stay ahead of the game with accurate analysis of past performance and accurate projections of future possibilities. An army of accountants with a lot of time can do that kind of planning. So can a huge, expensive main-frame computer.

And now, so can you. All by yourself. With the TARGET Business Planning System for as little as \$195 and an affordable microcomputer. You play the big business game for real, at a small-business price.

Target: reduced risk.

Business conditions change very fast these days. TARGET planning helps your company keep pace. Makes it easy to ask crucial "what if" questions — What if labor costs go up 15%? What if the prime rate increases 1.25%? — and get accurate answers at once. So you can plan for change in advance. Which helps reduce risk. Which helps keep your company's growth and profit on target.



TARGET does what you want.

- Cash flow analysis/projections.
- Sales projections.
- Budget planning.
- Job costing.
- Acquisition/merger analysis.
- Tax calculations/projections.
- Loan analysis.

You can do all this and much more with TARGET. You set the kind of results you want, and the steps you want taken to deliver them. TARGET is so flexible and has so many capabilities that it is a little like an army of accountants ready for



your orders. And the orders can be complex. "Figure likely future outcomes on the basis of past results." Or, "If this number is greater than that number, calculate this percentage. Otherwise calculate yet another percentage."

It does things your way.

With TARGET you can get printed reports, in the form you set up, for each of your procedures. You can also get printed reports of the steps you used in each procedure, so that others can use it. You save procedures and specific figures separately, so you can update or look at other possibilities fast, sometimes by changing just one number. You can feed reports directly into a word processing system. And if you want to change a report format, or add another year or branch or product into your calculations, that's easy too.

All you need to know is your business.

You don't have to know a lot about computers or, for that matter, about business planning to use TARGET profitably. TARGET understands an easy English-like language. It uses conventional mathematical steps. It comes with a manual that's been called "the best...full of clear examples and excellent sample models" (*Personal Computing* magazine, June 1981). And TARGET comes from a company — Advanced Management Strategies, Inc. — that's totally committed to giving you any help you need.

You can build on TARGET too.

The TARGET Business Planning System is fully integrated to let your planning capabilities grow. You can start with PlannerTM or PlannerCalcTM (same as Planner, only with an alternative way of setting up and calculating) at \$195. MasterPlannerTM combines Planner and PlannerCalc features and allows you to handle larger plans, \$495.

Options that work with any of the above: Business AnalystTM, which speeds the handling of more complex procedures, \$395; Peach PIETM, which lets you draw from and add to information in the Peachtree General Ledger package, \$179; and InterchangeTM, which lets you merge and split various procedures, \$139.

Plus TASKTM, a stand-alone project-management aid that performs critical-path analysis to help you meet tight schedules and budgets, \$329.

What machines?

You can use TARGET on most microcomputers, including those from IBM, Xerox, NEC, Apple, Zenith, Vector and Tandy.

Let us tell you more.

Get ahead of the game on TARGET. Call or write us today for the location of your nearest dealer. AMSI, Suite 200, 1935 Cliff Valley Way, Atlanta, Georgia 30329 404/634-9535



continued from page 81

Among the mailing-list packages available you should be able to find the best one for your business. Discussed below are 18 mailing-list packages. They include some of the most and least expensive, and some with complete or limited features. The packages cover a spectrum of

prices and features to give you a good idea of where to begin searching for the package that best fits your needs.

18 packages

Apple Computer's **APPLEPOST** was one of the first mailing-list packages. The main problem with this program is that it is difficult to ex-

cute a function without cycling through unnecessary graphics.

APPLESOFT does have one unique feature no other package has—a "soundex" search or find. If you don't know the correct spelling of a last name such as Johnston, you can enter Johnson or Jenson and the program will call up all of the records

NAME AND ADDRESS RECORD CONFIGURATIONS

This table describes the maximum number of characters allowed in each field or line of each in each mailing list package.

	APPLE COMPUTER APPLEPOST	CHARLES MANN AND ASSOCIATES	COMPUTER HOUSE SYSTEM	DR. DALEY'S SOFTWARE	D.B. SOFTWARE	INFORMATION UNLIMITED SOFTWARE	MICRO BUSINESS SYSTEMS	MICRO COMPUTER INDUSTRIES	PEACHTREE SOFTWARE	PRODIGY SYSTEMS	RADIO SHACK	STONEHENGE COMPUTER	SYNERGISTIC SOFTWARE				
Records/Company																	
Name	25	30*	33	40	30	12#	40&	27	15%	15**	30	25	##	16	40	32	24
Surname						12			20	15	25			18	40	32	24
Company Name		30	33	40	30	15	40	27	25	20	20	30		20	40	32	
Street Number									8								
Address Line	25	30	33	20	30	20	40	27	20	12	25	30	25	20	40	32	24
Address Line				20					20	20		30	25		40	32	
City		30		20		18		15	15					20		32	13
State		30		2		2		3	2					2			2
City/State	20		33		30		40			25	25	25	25		40	32	
Zip Code	9	9	33	9	10	5	9	11	5	9	9	6	5	9	10		9
Telephone	12	12		10		12		14	12		12	25					12
Telephone Ext.								4									
Comment Line	10		33	40		13			8	2	30	25		20		30	10
Code Line			33	40			15	6		6	30	25					3
Keyword Sort	10					8											
Label Code		30															
Header Line					X												
File Name					8												
Control No.								5									
External Code												12					
Select Code												12					

*—Apple III Mailing List Manager standard format.

#—Dr. Daley's default values. Allows up to 15 fields and 117 characters.

&—Dynacomp has five lines all user-definable and up to 80 characters per line with CP/M systems; 40 with Apple.

%—EasyMailer is completely user definable for up to 36 fields per record and these are just sample numbers.

**—Create-A-Base is completely user defined with horizontal and vertical layouts. Example shown above. Stores up to 10 user formats. Maximum 24 fields and 220 characters.

##—Prodigy System has 1,024 user-defined categories and 144 lines per record.

EDITOR'S NOTE: These names and numbers correspond to the numbers at the heading of the configuration and features sidebars.

JINSAM

Data Manager selected by NASA, Kennedy Space Center

SAVE TIME! SAVE MONEY!

**JINSAM saves taxpayers
100's of thousands of \$**



**"Much more powerful than
you can imagine!"**

**Robert Baker
Kilobaud Microcomputing**

JINSAM is an integrated system. It makes it easy to use your information to its fullest. No more will hundreds of valuable hours be spent searching or analyzing needed information nor re-entering information for various reports.

JINSAM transforms your desk-top computer into the "state of the art" data processing machine with features and accessories found nowhere, even at 10 times the price. NASA, Kennedy Space Center selected JINSAM 8.0 and saved approximately \$95,000 over other software/hardware costs. Riley County, Kansas also selected JINSAM 8.0 and saved approximately \$90,000 over other software/hardware costs.

JINSAM is designed for you. It is forgiving. It has help commands for every option, available at the touch of a button. The amount of information you store, its structure and/or your hardware can change but your data won't have to be re-entered. Recovery utilities are included even for catastrophes, security passwords are built in for privacy, simple editing and entry includes auto recall, and deleting records is easy and the space is reclaimed. JINSAM includes TWO FREE accessories for reports and labels. You have unlimited report formats with summing and lined up decimals and the label printer prints up to 5 across - any size and even allows single envelopes or index cards.

JINSAM 1.0 allows fast and easy file handling, manipulation and report generation for any CBM computer with CBM 2040 disk drive. It features a menu for ease, has encrypted passwords, 3 deep sorts, .5 to 3 second recall.

JINSAM 4.0 for CBM 4000 series adds JINSORT, user accessible machine sort of 1000 records in 15 seconds; compaction/expansion of information, automatic list maintenance, unlimited number of fields, unlimited record length and much more.

JINSAM 8.0 for CBM 8000 series has all 4.0 features plus unlimited sort, horizontal format, and search by key or record number.

JINSAM 8.2, NEW FOR '82 expands 8.0 capabilities by adding information search by word, key or record number and machine language print, format and manipulation routines.

- ★ CUSTOM DATA FILES
- ★ CUSTOM REPORTS/LABELS
- ★ KEYED RANDOM ACCESS
- ★ FAST/EASY/MENU DRIVEN
- ★ MULTIPLE SEARCH KEYS
- ★ PRIVACY ACCESS CODES
- ★ WILD CARD SEARCH

JINSAM EXECUTIVE version (soon to be released) is our most powerful professional system for the CBM 8000 and 9000 series. Executive will have 8.2 extended features plus allow multiple users with in-use lockout protection, executive command files, automatic math relations, join, merge or link files, greatly increased record capacity and machine information search by word, as well as by key or record number and many, many more features.

There are currently 7 more interfacing modules - and more under development, including independent interfaces between JINSAM and business packages for your G/L, A/R, A/P needs. We announce the availability of modules and enhancements in JINSAM's quarterly newsletter.

WORDPROPAC - Intelligent interface for WordPro 3, 3+, 4, 4+, creates lists of information from JINSAM files. It allows up to 10 conditions based on each item of information. Produce individualized letters, report cards, special reports, checks, invoices, etc.

MULTI-LABEL - Prints multiple labels per record with up to 2 lines for messages and consecutive numbering. Produce inventory, caution labels, bulk mail labels, etc.

MATHPACK - global calculator/editor +, -, *, /, by another field or constant; null (remove contents) of a field or replace contents of a field with any word, number or phrase. Sum multiple fields in each record or running sum of single field in all records. Extract information or effect permanent change. Replace in the same field or place in a waiting field.

DESCRIPTIVE STATPACK - Determine MEAN, MEDIAN, MODE, STANDARD DEVIATION, VARIANCE, RANGE. Generate HISTOGRAMS from 1 to 25 steps, and produce Z-SCORE reports.

ADVANCED STATPACK - (You must also acquire DESCRIPTIVE STATPACK) Generate one, two or three way CROSSTABS (number of occurrence) CHI SQUARE, LINEAR REGRESSION, with graphic representation and prediction, LINEAR CORRELATION and SIMPLE ANALYSIS OF VARIANCE.

CALCPACK - 2 way interface to VisiCalc or any user program. It lets you use VisiCalc for complex manipulation, editing, placing results in JINSAM for sorting, storing or moving data to WordPro as well as giving the ability for exchange with your own applications.

INTERAC - Interface which can read VisiCalc files, WordPro files and almost any sequential files

to build JINSAM databases automatically. For example: You could "download" information on holerith cards to sequential files and INTERAC would place them into JINSAM files.

All accessories are accessed thru the JINSAM menu and require security password to gain entrance.

JINSAM gives you FREEDOM OF CHOICE. Start with JINSAM 1.0 and upgrade hardware and data at any time. Choose from accessories at any time. The JINSAM Newsletter brings the latest updates, user input and uses and keeps an eye on the future.

JINSAM stands alone by placing "a lot of potential computing power in one integrated program package" (Fred Klein, Ferson div. of Bausch & Lomb). "The JINSAM package is justification for buying a system no matter what the hardware, be it Vector or Commodore or whatever the system" (Larry Colvin, Micro Computer Systems). It is a "grandfather" in this young field since the first JINI MICRO database system has been marketed since 1979. JINSAM EXECUTIVE will be the third generation in development. All JINSAM systems are sophisticated and flexible yet easy to use. JINSAM is saving its users valuable time and money in government, educational and research institutions, business and industry worldwide.

JINSAM is a Commodore approved product. See your local dealer for a demonstration.

JINSAM is a trademark of JINI MICRO-SYSTEMS, Inc.
WordPro is a trademark of Professional Software, Inc.
VISICALC is a trademark of Professional Software, Inc.
CBM is a trademark of Commodore Business Machines, Inc.

JINSAM Data Manager

.... Additional Information and nearest dealer
.... Newsletter Subscription (\$5 US/\$8 Worldwide)
.... JINSAM Demo Disk (\$15, plus shipping & tax)
.... User's Guide (\$40.00, plus shipping & tax)

Please send to:

Name _____

Position _____

Company _____

Address _____

City, State, Zip _____

Phone () _____

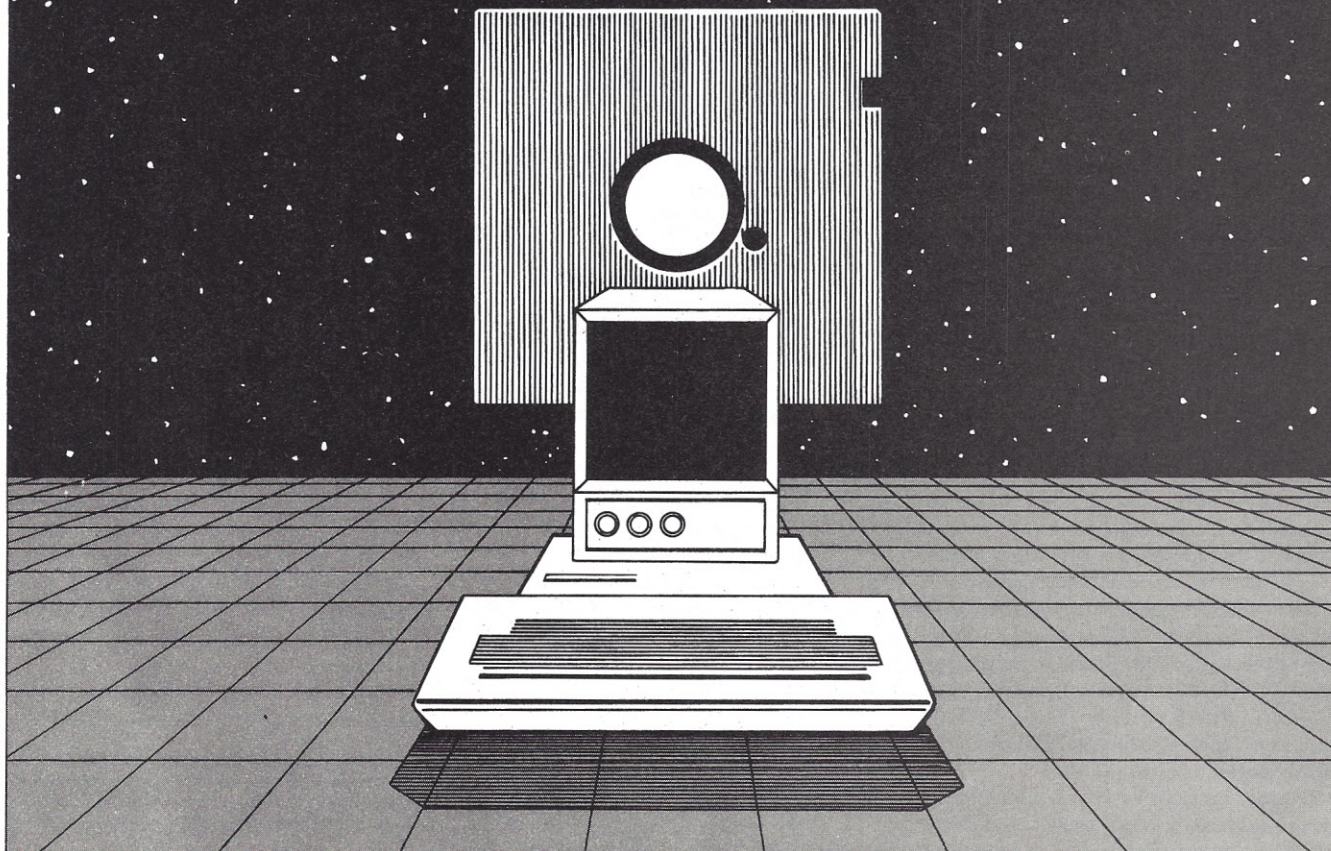
Computer, Disk _____

Application _____

JINI-MICRO SYSTEMS, Inc.
Box 274C • Kingsbridge Station
Riverdale, New York 10463
(212) 796-6200

Dealer Inquiry Welcome

Professional proofreading on the APPLE II Computer is now a reality



THE APPLE SPELLER fills the void that has consistently kept the large variety of excellent word processing packages for the Apple II Computer from approaching the power of a dedicated word processor. Finally, the first professional quality spelling verification program is available for the Apple II. The Apple Speller will certainly be the standard against which all other similar programs are compared.

The Apple Speller interfaces to the most popular Apple word processors including Applewriter, Apple Pie, Superscribe II, and Magic Window just to name a few. In fact, the Apple Speller can analyze the output of any editor that writes a standard Apple binary or text file to a diskette. In addition to this flexibility, the performance of the Apple Speller will astound the microcomputer world.

The Apple Speller is supplied with a 30,000+ word dictionary on a single 5 1/4" diskette with additional space to easily add another 8,000

words to suit your individual needs. The Apple Speller has built-in utilities to maintain the dictionary diskette. You can readily add words, delete words, and create an unlimited number of modified and/or new dictionaries for specific applications.

The Apple Speller is unbelievably fast. The first pass reads your document and collects all the words it contains at a rate of 5,000 words per minute. Next, the words are compared to the dictionary for spelling errors at the incredible speed of 50,000 words per minute. Finally, all misspelled words are marked as such in your document with a rate of 1,000 words per minute. This translates to proofreading a 10 page document in 1 minute if there are no spelling mistakes and 2 minutes, 15 seconds for an unlimited number of spelling errors.

Numerous options are provided throughout the program to enable you to completely control all activities of the Apple Speller. These include the ability to ignore both

control codes and formatting commands, an alphabetical listing of either misspelled words or all the words in your document along with usage frequencies, multiple options for the action taken with each misspelled word, and much, much more! A verification mode is provided to allow you to examine and dispense with misspelled words while viewing them in the actual context in which they appeared in your file.

The Apple Speller requires an Apple II/Apple II+ equipped with 48K, Dos 3.3, and two disk drives.

The Apple Speller is being introduced at the incredible price of **\$75.00!**



SENSIBLE SOFTWARE

6619 Perham Drive Dept. PC
West Bloomfield, Michigan 48033
(313) 399-8877

Visa and Mastercard Welcome
Please add \$1.25 postage and
handling per diskette

with last names that sound like Johnson or Jensen.

Also in the program's favor are its manual and "floating select" codes. The manual is well written and easy to use. The floating select codes allow you to pick records based on two character choices. You can choose letters A and B as the codes in any column such as A in column 2 and B in column 5. (It would choose records such as ZAXXB or DACDB.) The program will also print out a separate list of telephone numbers for sales calls.

Another package from Apple Computer is its **APPLE III Mailing List Manager**. This package retains APPLEPOST's good features, including soundex. It provides a standard-default format, but also allows you to easily define your own format. It includes four types of searches, and allows you to step through the program with single keystrokes—first, next, last and previous. It will also sort, merge and print "subsets" or sections of a list based on what is listed on the label and comment lines.

Charles Mann & Associates includes its **Master Mailing List** program in its two text-editor and processing packages. The mailing-list package is also combined with its medical-office package. Although the program has many desirable features, they are hard to find because the manual is not tutorial.

The package does contain standard features that add to the company's text-editing or medical-office packages. It has an eight-field fixed format with two comment/code fields, and five methods each to search and sort. These methods are by first and last name, city, zip code, code field and comment or optional field. When printing, the package uses standard labels and can print from one to three across at a time.

Computer House Division has a simple mailing-list program with a fixed 10-line format for some Commodore computers. It includes two

comment lines with up to 80 characters of any kind of information. It also has a good error trap in its two-character state field; it will only accept a correct abbreviation for each of the 50 states and D.C.

The program only prints out by zip-code range, with two labels across and four lines down. It has no search or sort procedures, just a sequential review by company name. You can edit each entry after it is displayed and reviewed.

D.B. Software's **Mailing Lister** features speed and merging capability. It merges with form letters you store with the mailing labels themselves. It uses last names and zip codes (with a delimiter asterisk and a three-character code attached) as the first two lines for sorting and searching.

Two useful printing functions include printing either labels or envelopes with a one keystroke command, and printing by selecting

mailing-list codes and beginning and ending zip codes.

Powerful package

Dr. Daley's Software **The Mail List** is a powerful mailing-list software package for the Commodore computers. It is written with a combination of BASIC and machine language which makes it fast. It also has a well-written, clear and concise manual. Its advanced version 4.8 can hold a large 4164 records per disk, and can handle up to 80 disks with one file name, a feature rarely found in other programs.

The package includes two function keys, one that retrieves a constant field for each record, and one that calls up a particular field from the previous record. You can set up the print routine according to four parameters you choose, and you can print out any four of a total of 15 fields.

DYNACOMP's **MAIL LIST 2.2**

WINCHESTER BACKUP

Back-up your Winchester with the new file oriented Model 150. . . Transfer data up to 13.4 formatted

megabytes to a tape cartridge. . . Use CP/M* and MP/M* compatible software, Drivers included. . . Just plug the new Model 150 into any S-100 compatible computer system. . . Contact us today for complete details!

**** Qantex**

Division of North Atlantic, 60 Plant Avenue, Hauppauge, NY 11788, (516) 582-6060
Toll Free (800) 645-5292

*Registered Trademark of Digital Research

**Registered Trademark of North Atlantic Industries, Inc.



has large fields—an entire line on the Apple II—and comes with prefix and suffix codes that make sorting and printing very flexible. It can store up to 1200 records on one disk. Its manual is short and to the point.

Its six-line, free format is based on a code line. This code line is determined by groups of three letters. You can enter any information on this line, but the total must be a multiple of three. You must also identify and

remember the meaning of your code lines.

Handling mail codes

Galactic Software's **MASS/MAIL SUBSCRIPTION SYSTEM** handles both foreign and U.S. mail codes. Its

MAIL LIST CHART OF FEATURES

Feature/Company

	APPLE COMPUTER APPLEPOST	CHARLES MANN AND ASSOCIATES	COMPUTER HOUSE SYSTEM	DR. DALEY'S SOFTWARE	D.B. SOFTWARE	INFORMATION UNLIMITED SOFTWARE	GALACTIC SOFTWARE	DYNACOMP	MICRO BUSINESS SYSTEMS	MICRO COMPUTER INDUSTRIES	NORTH STAR COMPUTER	PEACHTREE SOFTWARE	PRODIGY SYSTEMS	RADIO SHACK	STONEHENGE SORCERY	SYNERGISTIC SOFTWARE
Formats:																
—Fixed	•	•	•	•					•		•			•	•	•
—Free-form			•			•	•	•		•		•	•	•		•
—Combined			•									•				•
—Default	•	•		•		•					•	•		•	•	•
Sorting:																
—Alphabetical	•	•		•			•	•		•		•		•	•	•
—Zip Code	•	•	•		•		•	•		•		•		•	•	•
—Surname			•	•						•			•		•	
—First Name																
—Keyword/number		•	•		•	•			•	•	•			•		
—Range of names	•	•								•				•		
—State			•							•				•		
—Secondary field			•			•				•	•			•		•
—Multiple fields																•
Searching:																
—Keyword	•		•			•		•		•		•		•		
—Name		•	•		•		•	•		•	•	•	•	•	•	•
—Zip Code	•	•	•			•	•	•		•	•		•		•	
—Browse	•							•						•		
—Code name/number	•		•		•		•	•		•				•		
—Phonetic		•														
—First Name			•												•	
—City			•											•		
—Suffix/Prefix					•		•							•		
—Multiple fields																•
Search Functions:																
—First record		•							•				•			
—Last record		•							•				•			
—Advance one		•							•				•	•		
—Reverse one		•							•				•	•		
Default entries		•												•		•
Duplicate delete						•	•								•	
Merge mail lists						•	•		•	•				•	•	•

records are based on internally-generated control numbers. The control number is used for system identification and searches. You can sort by the first two names together and zip code. These features are stan-

dard, but speedy access time makes the difference with this software. Control-number access is instant.

Information Unlimited Software's **EasyMailer** is designed to work primarily with its EasyWriter word-

processing package, but it functions very well on its own. It is a flexible package and is easy to use. You set up a format with a "design" function and can use up to 36 fields, but the

continued on page 142

	APPLE COMPUTER APPLE COMPUTER APPLEPOST	CHARLES MANN APPLE III MAILING SYSTEM	COMPUTER HOUSE AND ASSOCIATES	COMPUTER HOUSE DIVISION	DR. DALEY'S SOFTWARE	D.B. SOFTWARE	INFORMATION UNLIMITED SOFTWARE	MICRO BUSINESS SOFTWARE	MICRO COMPUTER SYSTEMS	NORTH STAR COMPUTER	PEACHTREE SOFTWARE	PRODIGY SOFTWARE	STONEHENGE SOFTWARE	RADIO SHACK SOFTWARE SORCERY	SYNERGISTIC COMPUTER	SYNERGISTIC SOFTWARE		
Fields/Lines:																		
—Maximum no.	8	6	6	10	9	10	6	9	36	8	12	7	6	12	8	4	8	9
—Comment/Codes	2	2	2	2	4	3	2	2		2		2	2		1	1	1	2
—Category/Select															8			
Posting:																		
—Automatic	•	•							•		•	•	•	•				
—Batched			•	•	•	•	•	•		•					•	•	•	•
—Other																		
Zip Codes:																		
—5-digit only			•		•	•				•	•	•	•					
—9-digit	•	•		•			•		•					•	•		•	•
—Foreign allowed								•								10		
Merges form letters			•		•				•		•				•	•		
Printing Labels:																		
—All	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
—Alphabetical		•						•		•	•	•	•	•	•	•	•	•
—Merged letters			•		•					•	•		•	•	•			
—Selected records		•		•	•	•	•			•	•	•	•		•		•	•
—Zip Code order	•	•		•		•		•				•	•	•	•	•	•	
—Envelopes					•										•	•		
—Return address															•			
—Automatic screen									•						•			
—Telephone List	•	•																
—Master List	•	•													•			
—By codes			•		•		•			•	•		•		•	•	•	
—Every Nth record						•												
—Group search						•												
—One line across																•		
—All current																		•
—All on disk 1																		•
—All on disk 2																		•
—All on both disks																		•
Labels:																		
—Max. no. across	1	4	3	2	9	8	3	6	4	1	4	6	3	6	5	4	4	1
—Maximum lines	6	6	6	8	6	10	5	15	36	4	12	7	5		4	4	10	6

Now for the TRS-80™ Models I & III

LDOS

VERSION 5.1

THE TRS-80™ OPERATING SYSTEM

MODEL I AND III

- * **DOUBLE** Sided & **DOUBLE** Density support.
- * **AUTOMATIC** Density recognition.
- * 35, 40, 77, 80 and any other track counts are supported.
- * All available drive stepping rates are supported.
- * Hard Drive support, can be **HANDLED AS A SINGLE DRIVE**.
- * Hard drive partitioning, one drive can act as up to six.
- * Intermix 5", 8" and Hard drives, up to a total of 8 drives.
- * Compatible with the Model I Radio Shack Expansion Interface.
- * Upward compatible with TRSDOS (2.3 & 1.2 as documented).
- * Fully supports Microsoft language products for the TRS-80.
- * Complete media compatibility Model I to Model III and back.
- * Full support for LOBO's LX-80 interface.
- * Full support for AEROCOMP LC double density controller (DDC).
- * Full support for PERCOM's DOUBLER II.
- * Complete documentation (well over 250 pages).
- * Complete technical information.
- * A **TOLL-FREE** 800 number for customer service.
- * An **LDOS** users bulletin board on MicroNET.
- * A Quarterly **LDOS** users magazine (The **LDOS QUARTERLY**).
- * A liberal update policy.
- * An enhanced **BASIC (LBASIC)** including:
 - > Upward compatible with Microsoft Basic.
 - > High speed **LOAD** and **SAVE**.
 - > Run multiple programs with common variables.
 - > **BLOCKED** (variable length) files are supported.
 - > **DOS** commands may be executed from **LBASIC**.
 - > Built in string array. **SORT**.
 - > Single stepper for debugging.
 - > Several new statements and file modes.
- * A compiled **JOB CONTROL LANGUAGE (JCL)**.
- * **CONVERT** utility to move files from Model III TRSDOS.
- * An Extended Debugging and Monitor program (with disk access).
- * **CMDFILE** for movement of disk and/or tape system (/CMD) files.
- * Device independent operation.
- * Full **LINKing**, **ROUTEing**, **FILTERing** and **SETting** are supported.
- * **MiniDOS** feature for constant access to certain **DOS** commands.
- * **RS-232 DRIVER** for serial support.
- * Sophisticated communications software included.
- * Wildcard characters and partial Filespecs are supported.
- * **DATED FILES**, show when a file was last written to.
- * Backup: Mirror, by Class, if Modified, by Date, by Extension, etc.
- * Selectable **PURGE** for fast disk "cleanup" of unwanted files.
- * Print formatter, for control of printer output.
- * Built in printer **SPOOLER**, to both disk and ram.
- * Joblog to record all system operations with time stamps.
- * **UPPER** and **lower** case support, throughout the system.
- * Blinking cursor with selectable cursor character.
- * 128 character **TYPE AHEAD** buffering for keyboard input.
- * Assign strings to individual keys with Key Stroke Multiply (**KSM**).
- * **SUPER FAST** operation with the **SYSRES** feature.
- * Extensive user control and system feedback.
- * Advanced **PATCH** utility for easy maintenance.
- * Complete transportability of software among all **Z-80 LDOS** systems through the use of the **LDOS** high ram supervisory call system (**SVC**).
- * Dealers to serve users Nationwide and in the Common Market.
- * The only **DOS** with a limited **ONE YEAR WARRANTY!**
- * Enjoy a professional operating system on **YOUR TRS-80!**

* Specific hardware is required to use these features.

The Ultimate In
Operating Systems
For Model I & III

Only \$**169⁰⁰**
Version 5.1

- * Model I LDOS provided on 35 track single density media.
- * Model III LDOS provided on 40 track double density media.
- * LDOS can be provided on special media configurations at an additional charge.
- * Prices & Specifications are subject to change without notice.
- * Although not required, LSI recommends two or more drives when using LDOS.

For Further Information Contact The Distributor Or Dealer Nearest You:

(West)
LOBO DRIVES INT'L
354 S. Fairview Ave.
Goleta, CA 93117
(805) 683-1576

(Central)
GALACTIC SOFTWARE LTD.
11520 N. Port Washington Rd.
Mequon, WI 53092
(414) 241-8030

(East)
MISOSYS
5904 Edgehill Dr.
Alexandria, VA 22303
(703) 960-2998

(The Common Market)
MOLIMERX LTD.
1 Buckhurst Rd., Bexhill
Sussex, England
(0424)-220391

DEALER INQUIRIES WELCOME. LDOS is a product of LSI. TRS-80 & Radio Shack are trademarks.

**LOGICAL
SYSTEMS
INC.**

Mequon, WI 53092
(414) 241-3066

Energy analysis

continued from page 71

area of its windows. The tenant determines the thermostat set points, based on what feels comfortable, and shares the responsibility for appliance-heat gains with the builder.

SUNDAY will run on several different personal computers. A version for the Apple became available in October. SUNDAY is written in—and therefore requires—the programming language UCSD Pascal. The software costs \$495. Packaged weather data for Seattle and Yakima, Wash., Portland, Ore., Albuquerque, N.M., and Madison, Wis., are included; for other sites there is an additional fee.

SUNCODE, the more advanced energy-analysis program, costs approximately \$1500 and runs in FORTRAN. Details are available from Ecotope Group, 2328 East Madison St., Seattle, WA 98112.

But if some solar architects have their day, the use of the personal computer will not be limited to simply designing the solar home. They intend to put the machine to work monitoring and controlling the operation of the passive energy system itself. Homes driven by personal computers are still on the farther reaches of reality, but experimental versions are beginning to appear. One of the better examples is the Ahwatukee House of the Future outside of Phoenix, Ariz.

A roadside attraction

Actually the Ahwatukee is a modern-day version of another roadside attraction. It was conceived by a contractor as a means of luring outsiders into the area. They come to gawk at this futuristic home—and then he shows them other “normal” homes that he has for sale.

Built with the aid of the Motorola Semiconductor Group, the Ahwatukee House is made of thick poured

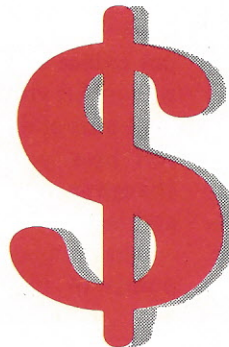
concrete used as a passive solar thermal mass. It is circular in design and is powered by five 8-bit microprocessors supplied by the electronics firm.

The computers constantly monitor, through distributed sensors, the temperature in the solar collectors, the position of the sun, the heat needs for various portions of the house as well

At last!

an application that interests everyone
..... with a manual everyone will love

Our Application:



Money. Where does it come from? Where does it go? How much do you have and how much can you afford to spend... You're interested... Your spouse is interested... Your accountant is interested... The taxman is interested... MONEY MAESTRO provides the answers. Quickly. Accurately.

Our Manual:



That's it. No long dry manuals to read. No jargon. If it isn't obvious what you need to do next, just press “?” (followed by RETURN) and MONEY MAESTRO will lead the way. Of course we give you a manual to page through if you choose, but if you have a computer and can fill out a check... you can run MONEY MAESTRO without opening the book.

Money Maestro™

Now runs on APPLE !

For MONEY MAESTRO Home Banking System, mail to:
InnoSys Inc., 2150 Shattuck Ave., Berkeley, CA 94704, (415) 843-8122

Name _____

Address _____

City _____ State _____ ZIP _____

I'm Interested! ☐ Apple (DOS)
☐ User's Manual (\$20.00) ☐ Apple (softcard)
☐ dealer info ☐ 8" CP/M ☐ N★5¼"
I'm Sold! ☐ 5¼" Micropolis

☐ MONEY MAESTRO (\$200.00)

Payment: ☐ COD ☐ check enclosed amount \$ _____

☐ Visa/Mastercharge # _____ exp. date ____ / ____

Signature _____

Allow \$3.00 Shipping & Handling (overseas: \$10.00).
California residents add sales tax.

“today's idea...
... tomorrow's utility”

InnoSys
INCORPORATED

as the water system and the swimming pool. With this information the computer runs the house, telling which heat, and how much, goes where.

Giving instructions

The program for Ahwatukee, called Tukee, is written in PASCAL, but the homeowner need only give the computer instructions—such as which lights should be on, what temperature the house should be, etc.—in English to run the system.

Even those who created Ahwatukee concede that the home's cost—approximately \$2.5 million—and technical problems make it not the home of the present. They add that despite its experimental nature, solar energy has been given increased credibility by the potential of Ahwatukee.

"It is a fairly complicated system

with which we're working," says Gary Kloesz, a Motorola engineer who worked on the project. "But even though we're far away from mass

producing these homes, we've ironed out most of the problems so that even now it works worse than a television, but better than a car."

Tracking those accelerating car costs

J.F. Sullivan

With the price of gas what it is, everyone is interested in finding ways to reduce the cost of operating a car. This TRS-80 Model I program will not reduce the cost of driving, but it will make you aware of how much each mile of driving costs. It will also tell how your miles-per-gallon change as you alter the way you drive and maintain your car.

The program gives four main points of information: miles-per-

gallon, miles-per-quart of oil, cost-per-mile to operate the car and when the car's next oil change is due. Through the use of a data file stored on the same cassette as the program, records can be kept for the lifetime of your car. With an average oil change interval of 5000 miles, the program has room for the first 125,000 miles of your car's life.

The information is grouped into 'cycles' based on oil changes. Every

OVER 70 TRS-80 PROGRAMS ON TAPE EACH YEAR... ... FOR UNDER \$0.75 (THAT'S SIX BITS) APIECE!

For the MODEL I & III

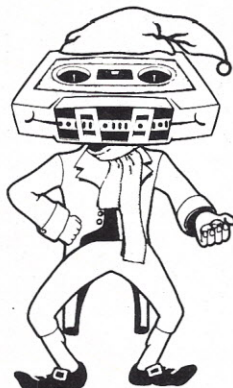
Ol' Ebenezer Cload wiped his glasses off — and grabbed for his gold pouch! With **CLOAD** Magazine, he could use and enjoy his computer for the price of a turkey with stuffing! And he could send Bob home early, since the programs did not have to be typed in!

He now gets a 30 minute tape each month with 7 or more practical, tutorial, utility, and game programs to **CLOAD** and run. While he **CLOADS** the programs, he reads the editor's babblings that come with each tape.

Don't let ghostly images cloud your TRS-80's screen. Get a subscription to **CLOAD** Magazine!

The Bottom Line:
1 year (12 issues)\$42.00
6 months (6 issues)\$23.00
Single copies\$4.50
Anthology #1\$10.00
Anthology #2\$15.00
MasterCard/Visa/Gold also welcome

The Fine Print:
Issues are sent First Class Mail.
All issues from Oct. 78 on available — ask for list (24 Level I issues also).
Programs are for 16K Level II, 16K Model III, and occasionally for disks.
Calif. residents add 6% to single copies and anthologies. Overseas — add \$10 to subscriptions, \$5 to anthologies, and \$1 to single copies. Sent AO rate.
TRS-80 is a trademark of Tandy Corporation.



For the COLOR COMPUTER:

You just spent your vacation money on the Extended BASIC Color Computer, and now you want to buy software!!!!???

Don't skip meals — get **CHROMASETTE** Magazine! Each month your computer will get a balanced diet of 6 or more programs on cassette (just load and run!). Also, along with the tape comes some notes on the programs and tidbits on the Color Computer world.

CHROMASETTE Magazine — for those who relish every byte (that pun even hurt me).



The Bottom Line:
1 year (12 issues)\$45.00
6 months (6 issues)\$25.00
Single copies\$5.00
Calif. residents add 6% to single copies.
Overseas — add \$10 to subscriptions, and \$1 to single copies. Sent AO rate.

The Fine Print:
Issues are sent First Class Mail.
All issues from July 81 on available — ask for list. Programs are for the Extended BASIC model only.
MasterCard/Visa welcome!

CLOAD Magazine Inc.
P.O. Box 1448 Santa Barbara, CA 93102 (805) 962-6271

© 1981

Chromasette Magazine
P.O. Box 1087 Santa Barbara, CA 93102 (805) 963-1066

time the oil is changed, the information since the last change is computed and stored. By comparing results at each oil change, the effects of a tune-up, of changing types or brands of oil or gasoline and of changing your driving habits can be seen.

The program guides you through the use of the cassette recorder when the data file is read and again when it writes the updated file back to the tape. The main part of the program is a series of questions such as, "Did you fill up with gas? Did you add oil? Did you change the oil?" If you answer yes to the first question, for instance, it will ask further questions on the cost of the gas and how many miles-per-gallon you got from it. Each time the computer is given new data on gasoline use, it displays the miles-per-gallon (MPG) for the preceding tankful, and cumulatively for

the entire period since the last oil change.

Expenses, expenses

The final question in the main part of the program is "Any other ex-

After the program is updated with all the new entries, the data file must be sent to the cassette. The program directs you with step-by-step instructions on how to accomplish this. There is also the option of writing a

"I can see just from the miles-per-gallon figure on the computer that it's time for a tune-up. The figures also convinced me not to drive at 70 mph."

penses?" Here you enter repairs and maintenance other than gas and oil. You make the decision as to how much of the total costs of your car to enter. If you consider insurance premiums or car payments part of the auto's operating cost, then include them in this section of the data bank.

backup copy of the data. It would be a good idea to do this, if not every time, at least at every oil change.

At the end of the program the series of records on your car are displayed. (See figure 1.) You will sometimes see one of the MPG figures marked as "tentative figure."

ADVENTURES!!!

For TRS-80 and COLOR-80. These Adventures are written in BASIC, are full featured, fast action, full plotted adventures that take 30-50 hours to play. (Adventures are interactive fantasies. It's like reading a book except that you are the main character as you give the computer commands like "Look in the Coffin" and "Light the torch.")

Adventures require 16K. They sell for \$14.95 each.

ESCAPE FROM MARS (by Rodger Olsen)

This ADVENTURE takes place on the RED PLANET. You'll have to explore a Martian city and deal with possibly hostile aliens to survive this one. A good first adventure.

PYRAMID (by Rodger Olsen)

This is our most challenging ADVENTURE. It is a treasure hunt in a pyramid full of problems. Exciting and tough!

TREK ADVENTURE (by Bob Retelle)

This one takes place aboard a familiar starship. The crew has left for good reasons - but they forgot to take you, and now you are in deep trouble.

DEATH SHIP (by Rodger Olsen)

Our first and original ADVENTURE, this one takes place aboard a cruise ship - but it ain't the Love Boat.

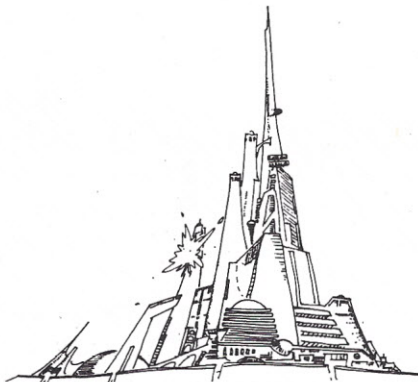
VAMPIRE CASTLE (by Mike Bassman)

This is a contest between you and old Drac - and it's getting a little dark outside. \$14.95 each.

QUEST

QUEST - A NEW IDEA IN ADVENTURE GAMES! Different from all the others. Quest is played on a computer generated map of Alesia. Your job is to gather men and supplies by combat, bargaining, exploration of ruins and temples and outright banditry. When your force is strong enough, you attack the Citadel of Moorlock in a life or death battle to the finish. Playable in 2 to 5 hours, this one is different every time.

16K COLOR-80 OR TRS-80 ONLY. \$14.95



ARCADE AND THINKING GAMES

16K and extended or level II BASIC

TIME TREK, REAL TIME REAL GRAPHICS TREK. See the torpedoes fly and Klingons explode. No more scrolling displays, no more turn taking. - This one has real time and real displays. In BASIC - for 16K level II or extended color BASIC. \$14.95.

STARFIGHTER - This one man space war game pits you against spacecruisers, battlewagons, and one man fighters. You have the view from your cockpit window, a working instrument panel, and your wits. Another real time goody. \$9.95.

BATTLEFLEET - This grown-up version of Battleship is the toughest thinking game available on 80 computers. There is no luck involved as you seek out the 80's hidden fleet. This is a topographical toughie. \$9.95.

SLASHBALL - A two player game of strategy and skill, this is like nothing you have ever seen before. This takes fast fingers, quick wits and concentration. Playable from age 6 to 65, it is a good family game. \$9.95.

MINOS - 8K - Features amazing 3D graphics. You see a maze from the top, the screen blanks, and when it clears, you are in the maze at ground level finding your way through on foot. Realistic enough to cause claustrophobia. \$12.95. (COLOR-80 ONLY)

Please specify system on all orders

This is only a partial listing of what we have to offer. Send for free catalog to:

AARDVARK - 80

**2352 S. Commerce, Walled Lake, MI 48088
(313) 669-3110**

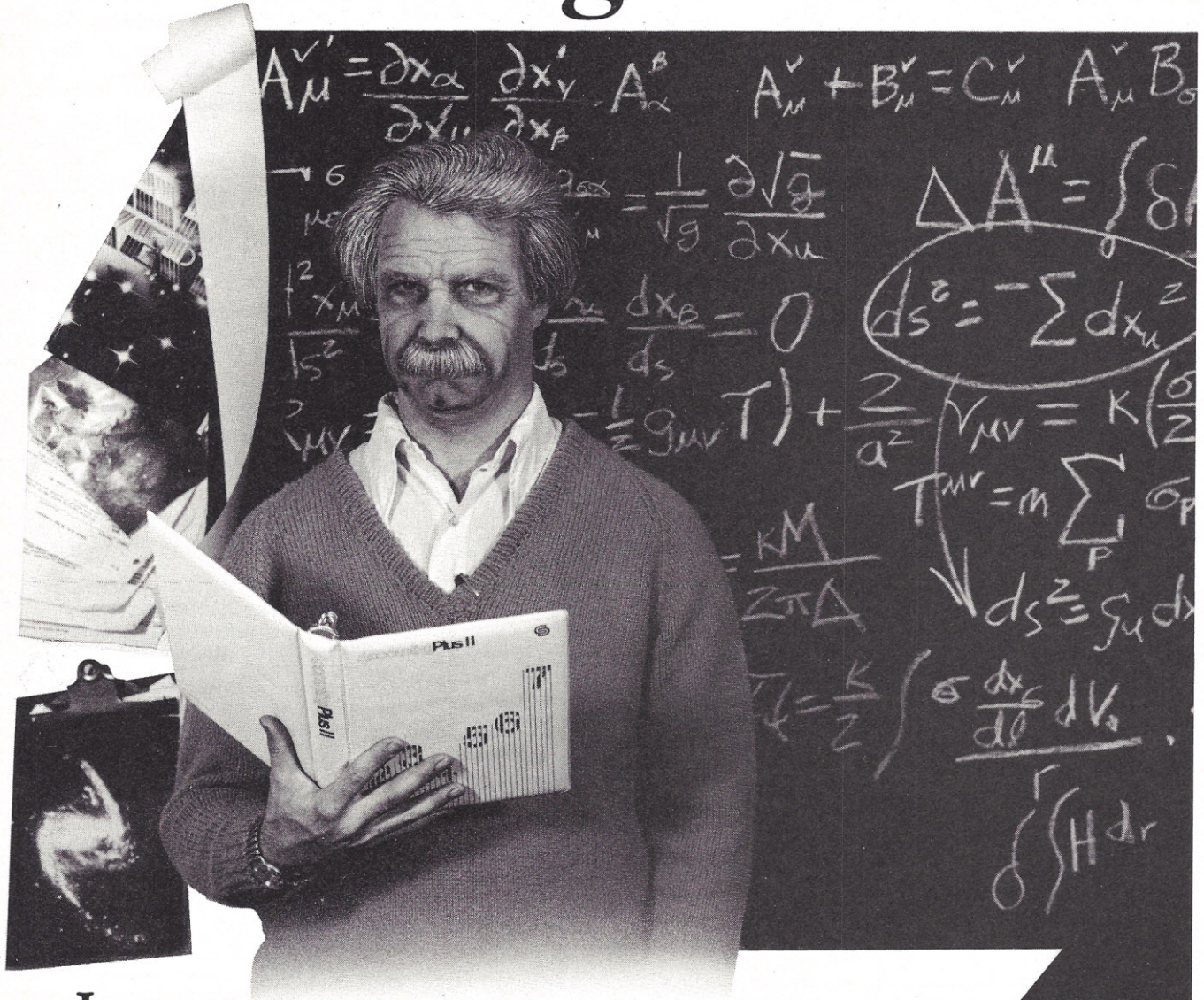
TRS-80

COLOR-80



Accounting Plus II

It Figures



It figures that the same people who brought you Accounting Plus* on the larger computer systems wouldn't forget the Apple.** Accounting Plus II brings to the Apple Computer a completely integrated, easy to use accounting system. Accounting Plus II doesn't require any special hardware, only 48K of RAM and two floppy drives or hard disk, and you don't have to be a CPA to use it. Accounting Plus II organizes and streamlines your paper flow and generates checks, invoices, statements and purchase orders on pre-printed forms. The system supports a solid audit trail which your business requires and your accountant demands.

Modules now available:

- General Ledger
- Accounts Receivable
- Accounts Payable
- Inventory with purchasing

For additional information call or write
Systems Plus Inc., 3975 East Bayshore,
Palo Alto, CA 94303 Phone 415/969/7047

Seeing is believing.

Systems Plus



*TM of Software Dimensions, San Jose, CA
**TM of Apple Computers, Cupertino, CA

This is due to a routine in the program that is used to make the figures as accurate as possible. If you did not fill with gas at an oil change, some of the gallons in the next gas fill should be considered with the previous cycle, while the rest should be included with the present cycle. The program cal-

culates these gallons and corrects the figures at the first gas fill after an oil change.

A small reminder

One main feature of the program is its reminder of when the next oil change is due. When you initialize

the program, input the desired time and mile intervals between oil changes. These set intervals can be altered later if you change your mind.

Before running the program for the first time, the data file on the tape must be initialized. The program is set up for the data file to be five tape-counter units behind the program. (You could put the file at some convenient number like 50 or 100, or even on a separate tape.) To initialize the file, set up the recorder for WRITE (push play and record), and enter the following direct statement: PRINT#-1.0,0,0,0,0,0,0

The first time you run the program you have to answer several questions concerning present mileage, present date and how often you plan to have the oil changed. Thus, for cycle accuracy it would be best to start using the program at the time you have an oil change and fill with gas. It won't do any harm to start at some other time, but the figures for the first oil-change cycle will not be as accurate.

In running the program, keyboard entries for how much gas and oil was put in the car, mileage numbers, dates and cost figures are always input as numbers. Replies to non-numerical questions, those that are answered yes or no, are input with a 'Y' or 'N.' The prompt for these is '(Y/N).' In addition, when the computer finishes some operation and is ready to continue, it asks 'Ready?' You need only push 'Return' to continue.

Fill it up

It might seem a bother to run the program every time you buy gas. You might be tempted to wait and enter several gas fills at one time. However, I can see just from the miles-per-gallon figure after each gas fill if it is time for a tune-up. I'll usually see a drop of about 1.5 or 2 MPG if I've waited too long.

The program also convinced me not to drive at 70 mph—as it works out, my car seems to be most efficient at about 60 mph.

Figure 1

Car Records

CYCLE	SRT MILE	SRT DATE	TOT MILES	MPG	COST/MILE
1	1	1/01/79	4800	22.57	\$.18
2	4800	5/26/79	4500	24.89	\$.16
3	9300	11/17/79	5200	23.65	\$.15
4	14500	3/16/80	4800	22.89*	\$.14
5	19300	6/27/80	0	.00	\$.14

* = TENTATIVE FIGURE

The cycles are the oil-change cycles. (The cost figure is cumulative. It is not the cost during that cycle but the cost-per-mile from the beginning of the program to the end of that cycle.)

Figure 2

Variables used

C	Cost entry
C5	Total cost since M9
D	Date entries
D1,D2,D3,D9	Date-print variables
D5	Oil-change interval, months
F	Mile-input check flag
G	Gas input
G2	Oil-change gas ratio
G1,G8,G9	MPG-display flags
H	History array
H(1,0)	Gallons used
H(1,1)	Quarts used
H(1,2)	Total miles
H(1,3)	Start mile
H(1,4)	Start date
H(1,5)	Cumulative cost per mile
I	Number of cycles (start at 1)
L	Record display line counter
M	Mileage entry
M1	Last mile entry
M2	Miles last tankful
M3	Miles since last change
M4	Last gas fill
M5	Last oil change
M6	Miles this tank during last cycle
M8	Oil change interval, miles
M9	Program start mile
N	Cycle pointer
O	Oil input
R	Ratio gas used last oil cycle
RS	Response
T	Tape counter reminder
X	Change flag
Y	Oil added change flag
Z	Initialization flag

Investment management

continued from page 40

would take me well over a week to do with a pencil," says Reiback.

Besides developing charts and graphs for himself and his clients, Reiback shares his findings with the audience of "The Commodity Club Show," a weekly program broadcast Sunday evenings by Manhattan Cable Television.

The data that Reiback collects to calculate his ratio comes from his membership in the Personal Computer Technical Analysis Group. Tim Slater, the Group Coordinator, says, "Our analysis starts when people place their bets. If a company controller sees a big contract coming, he tells his friends and they buy stock. This is reflected in the numbers we work from."

Slater was among the original group of four technical traders who

recognized the potential of the personal computer for preparing the charts and studies that are the basis of technical analysis. In 1979, he began working with Dr. Jim Schmit, a professor of computer science at Loyola University. Schmit turned the group's technical-trading concepts into programs for the Apple.

Over the next few years the group expanded rapidly and now has 1050 members. The members receive the largest integrated collection of commodity and stock programs for the Apple, called Compu Trac.

Slater expects 1000 new members to join the analysis group this year. "About 30 percent of our members are brokers or brokerage firms and the rest are doctors, lawyers and other professionals," he says.

The group began working with

commodities information. Last year they expanded Compu Trac's programming capacity to include stock and option data.

Interactive Data Corporation also offers a service for the technical analyst called IDC PRICE. It provides both current and historical data on stocks and options via a personal computer.

According to Product Manager Edward O'Rourke, Jr., the service enables users to "retrieve historic prices and to set up, store, modify and price portfolios." Access to IDC PRICE is provided on a dial-up basis.

The service handles portfolios containing up to 200 securities that can be individually priced on-line. Each security and option is reported in terms of high, low, close and volume. The data includes information on

RM/COBOL™ MAKES IT ACROSS!

... FROM ONE OPERATING SYSTEM TO ANOTHER! A VITAL WAY TO PROTECT YOUR SOFTWARE INVESTMENT FOR THE FUTURE!!

The **RM/COBOL** language runs on more different Operating Systems and more different-sized computers than any other similar language. For starters, it runs on NCR and TI minicomputers and, in the micro field, on the CP/M[®], MP/M[®], TRSDOS[®], OASIS[®], MOASIS[®], and UNIX[®] (ONYX version) Operating Systems... to mention only a few.

Until now, serious business software of the scope and flexibility seen in the minicomputer world has not been available on micros. **RM/COBOL** now allows transfer of such software with a minimum of fuss.

We have participated in such a mini-to-micro transfer of a major set of general business software... using **RM/COBOL** as the transfer mechanism, of course. Running on literally thousands of minicomputers, these refined, enhanced, and proven software packages cover A/R, A/P, G/L, P/R, Order Entry (with Invoicing and Inventory Control) as well as Sales Analysis. The packages define a new level of achievement for features and flexibility in micro applications software and offer top quality at a reasonable price.

For immediate information, call 714-848-1922 for your complete product descriptions.

... PLUS ALL THE OLD, FAMILIAR FAVORITES that we continue to offer, such as:

General Business—Client Accounting (CPA Write-up)
FMS[®] (Financial Modeling System)
NAD[®] (Name and Address System)

Real Estate—REAP (Real Estate Acquisition Programs)
PMS (Property Management System)
MLS[®] (Multiple Listing System)

Health Care—APH[®] (Automated Patient History)

Word Processing and System Software—Magic Wand[®]
QSORT[®]
CBASIC2¹⁰

and Cybernetics' unique TRS-80[®], Model II CP/M offering high performance, hard disk support, and CP/M compatibility.

Trademarks of:

1—Ryan McFarland Corp.; 2—Digital Research, Inc.; 3—Tandy Corp.; 4—Phase One Systems, Inc.; 5—Bell Telephone Laboratories, Inc.; 6—American Business Systems, Inc.; 7—Structured Systems Group, Inc.; 8—Cybernetics, Inc.; 9—Peachtree Software, Inc.; 10—Compiler Systems, Inc.



CYBERNETICS
N
C

(714)848-1922

8041 NEWMAN AVE., SUITE 208
HUNTINGTON BEACH, CA 92647

over 43,000 securities and options ranging from mutual funds to various market indicators. Data gathering and updating is done by the Associated Press for the majority of U.S. and regional exchanges including Montreal and Toronto.

To the rescue

"The VisiCalc program dramatically changed the attitudes of fundamentalists toward the personal computer," says John McMullen of McMullen and McMullen, a consulting firm specializing in end-user support within the financial community. "I've had a fundamentalist tell me that in running one security through a VisiCalc program, he saw a pattern that led him to sell early, a pattern he would not otherwise have seen. The fied the cost of a string of Apples," he says.

savings on that security alone justified. Joe Scarella, an information manager with Morgan Guaranty Trust, says his firm's nine Apples are used with VisiCalc programs to build the models they use in corporate research.

"The analyst who has no computer sophistication can get right down to model building with VisiCalc," Scarella says. "He doesn't have to deal with the pitfalls of user syntax. Also, the self-contained aspect of the personal computer goes a long way toward alleviating the fear that many analysts have of using outside time-sharing systems."

"There are a lot of repetitive tasks in analysis," says Alice Bradie, a senior analyst with L.F. Rothschild, Unterberg and Towbin. "I use both the VisiCalc programs and the Magic Window word processor to free me

from those repetitive tasks." Whenever Bradie does direct research on a company, she brings a 20- to 50-page questionnaire with her. "Without the personal computer, it used to take me three days to prepare the questionnaire. Now it takes me a day.

"I'm a believer," says Bradie. "VisiCalc and Magic Window have made a different course of action possible in my research, resulting in a different product." 

Editor's note: The investment methods presented here are designed to assist people in making their own decisions in connection with investments. There's no magic in these methods. Any stock-market results which may have occurred in the past may not recur in the future. It is always possible that some unforeseen factor or event may be present.

LOOK ON THE BRIGHT SIDE



Inventory Management for Small Computers

Chuck Atkinson

If you own a retail store or work in one, you need this book to cut costs and improve profits. The control program will provide important inventory information, prepare purchase orders like magic, adjust stock when printing a sales ticket, and much more!

ISBN 0-918398-48-7

\$16.95

Instant BASIC, 2nd Astounding! Edition

Jerald R. Brown

This will teach you the fundamentals of BASIC in a clear, non-boring style, with over a gross of mostly quick, often fun and always educational little programming activities to demonstrate statements, functions, and useful techniques.

ISBN 0-918398-57-6

\$12.95

Computers for Everybody

Jerry Willis and Merl Miller

As the title implies, this fun-to-read book covers all the things that you, as a non-technical beginner, should know about computers. If you're anxious to buy one, use one or just want to find out about them, read this book first.

ISBN 0-918398-49-5

\$5.95

WE MAKE COMPUTER BOOKS EASY

Please send me the book(s) I have checked below. I understand that if I am not satisfied, I may return the book(s) for a full refund.

☐ Computers for Everybody ☐ Instant BASIC

I enclose \$_____ plus \$1 to cover handling.

NAME _____

ADDRESS _____

CITY, STATE, ZIP _____

☐ Inventory Management

☐ Please send me your catalog—BRAIN FOOD.

dilithium Press
P.O. Box 606
Beaverton, OR 97075

dilithium Press

P.O. Box 606
Beaverton, OR 97075
800-547-1842

Call for store nearest you that carries our books.

***THE LAST WORD IN WORD PROCESSING
FOR APPLE III***

WORD III™
PROCESSOR

***QUALITY
reports
manuscripts
documentation
correspondence***

EASY TO USE

Suggested retail \$195

WESTICO
The Software Express Service

25 Van Zant Street, Norwalk, CT 06855 (203) 853-6880 Telex 643-788

Dealer inquiries invited.

Apple is a trademark of Apple Computer.

© 1981 Westico, Inc.

High-level languages

continued from page

check out small chunks of code at a time. The compiled source code is reduced to a series of machine-language calls to the core routines of Forth. So for many applications the speed of executing a Forth program is sufficiently fast so that machine code isn't needed.

Public-domain, source-code listings for the figForth (Forth Interest Group) package are available for \$30, including an installation manual. Mountain View Press supplies figForth on disk for many of the popular personal computers such as the Heath/Zenith H-89 and the Atari. With manuals, figForth costs under \$100.

Forth is both a high-level language and an operating system. Most implementations use a built-in Forth operating system. The space normally occupied by a regular operating system (eight to 16 kbytes) isn't needed. Typically, the complete Forth package—and reasonably sized applications programs—run in 16 kbytes of RAM.

Complex COBOL

COBOL was developed for business use. It's an old language and suffers from a lack of development that marks the sophisticated high-level languages of today. COBOL is compiler based, but its complex formats use large amounts of memory. For a personal computer with a small amount of memory, COBOL may not be a good choice.

One advantage of COBOL is its programming clarity. The long definitions and keywords make for a clear program that's easy to understand and modify. Another advantage is the vast amount of available COBOL applications programs.

The prices for COBOL packages are generally between \$200 and \$850. Then you must add another \$200 for a sorting package. For a small-business machine the cost of a COBOL package can run even higher.

C stands for language

The C programming language is popular with engineers who develop systems software. The most visible form of C language system software is the Unix operating system written at Bell Laboratories.

A key feature of the C language is its portability. Source code written in C, like Unix, can be put on almost any type of hardware. All that's needed is a C compiler for the target computer. Simply run the C-language source code through the compiler and, assuming basic hardware features like terminals and disks are the same, the program is ready to run with little or no change.

The C language is not yet a real factor for personal computers. The most popular C software available is Tiny C from Tiny C Associates. 



HAVE YOU READ PEELINGS II ?

Entering its third year, *Peelings II* is widely respected in its field. It is a special magazine which evaluates Apple II software. We review all kinds of software, from cover to cover.

Our reviews are sometimes humorous, occasionally blistering, but always honest, informative and to the point.

Subscribe Now. Our promise is the Truth, nine times a year. You can't go wrong. (Money-back guarantee, of course.)

PEELINGS II

Dept. P

P.O. Box 188

Las Cruces, N.M. 88004

(505) 526-8364

One year (9 issues)

\$21.00/U.S.—\$28.50/Canada, Mexico

\$44.00/Foreign

CIRCLE 36

Apple Software Development Tools

MicroCraft offers the Apple user a flexible set of development tools. This includes a low-cost full screen editor, the most powerful 6502 Macro Assembler available, and a compiled graphics language optimized for real-time applications. Each package compliments any Apple system and together they offer unequaled power and versatility.

RGL Real-Time Graphics Language

Do real-time animation * Similar to 'C' * Display, move and rotate 3D objects * Compiles text files to 'BRUN'able binary object files * Uses both HI-RES screens

*85 / *20

MacroLink Complete 6502 Assembler

Disk Assembler * Text to binary object * Standard 6502 mnemonics * Recursive macros with up to 10 arguments * Nestable conditional assembly * Links source or object code * Nestable file includes * Unlimited source file size * Editor provided

*125 / *15

6800 CROSS ASSEMBLER

All features of MacroLink, but uses standard 6800 series mnemonics to create 6800 object code

*125 / *15

SuperEdit Full Screen Editor

Horizontal scrolling allows 80 columns * Uses standard text files * Move cursor by character, line or page * Find, search and replace * Block move and copy * Use with RGL or MacroLink * 80 column video board versions available for Videx, Sup-R-Term and others.

*75 / *15

DiskScreen Disk Utility

Displays a complete disk sector in hex and ASCII using HI-RES screen * Edit sector by typing over display * Source listing provided.

\$40 /

Complete Assembler System (MacroLink, SuperEdit, DiskScreen)

*200 / *25

Complete Graphics System (RGL, SuperEdit)

*125 / *25

Systems available to utilize 16K or Saturn Systems, Inc. expansion boards

Please inquire

COMMODORE PET versions of MacroLink, SuperEdit and DiskScreen are available.

Z-80 SOFT CARD versions of all MicroCraft software are also available.

All programs require a single drive and 48K. When ordering please specify configuration. Complete Software Pkg./Manual Only.



MicroCraft Systems, Inc.

188 Kerby Rd. * Grosse Pointe Farms, MI 48236
Telephone (313) 996-1297

CIRCLE 37

OUTLOOK

continued from page 16

other Turtle Learning Centers around the country as our new organization gains momentum. We like to think we're an idea whose time has come."

Lifeboat plugs "standard" OS

Lifeboat Associates, in a move that president Tony Gold describes as, "not very risky, backing IBM," recently announced that it will market SB-86, an operating system functionally identical with MS-DOS (from Microsoft) and PC-DOS (from IBM). All three will then be able to run on the IBM Personal Computer and functionally identical machines that are expected to appear soon.

Individuals shouldn't expect to be able to buy the system immediately, as the initial target customer is the original-equipment manufacturer. This operating system will, if Lifeboat is correct, soon begin showing up in complete turnkey systems sold to end users.

PC-DOS is the operating system that IBM sells as the standard OS for its personal computer. Developed by Microsoft of Bellevue, Wash., the operating system is said to offer easy conversion of programs that run under the popular CP/M operating system from Digital Research. CP/M is also offered by Lifeboat.

SB-86 has many features that make it desirable. It is written entirely in 8086 assembly language. This means it has speed and efficiency advantages over other systems that have been translated from 8-bit counterparts. (The operating system can use 8086 assembly language even though the processor in the IBM Personal Computer is an 8088. This is possible because both processors execute the same instruction set.)

SB-86 also has no 64k program-space limitation, although no single program module can be larger than that size. A relocatable linking loader can provide for separate program segments. The OS has no file or disk-size limitations, unlike CP/M, which is limited to 8 Mbytes. Thus SB-86 users don't have to break a 24-Mbyte disk into three separate logical disks to interface with SB-86, as would a CP/M user. The OS also has variable disk-sector size, so hardware interfacing is eased. Disk-using programs can specify any logical record size, providing an

efficient system for large-file handling programs like data-base management systems.

For more information, contact Lifeboat Associates, New York, NY 10036; (212) 860-0300.

What's new in Japan?

Think of a four-pound computer with a full-size keyboard, four-line display, tape-drive memory, printer and enough computing power to make it really useful. Then price it below \$1000. This and many more new products awaited the swarms of people who attended this year's Japan Data show in Tokyo.

Major exhibitors included NEC, Toshiba, Sharp, Hitachi, Fujitsu, Panasonic/Matsushita, Casio, Sony, C. Itoh and Epson. New personal computers were shown by many of the companies, along with products from companies like Aval and Anritsu, which as yet haven't established a presence in the American marketplace.

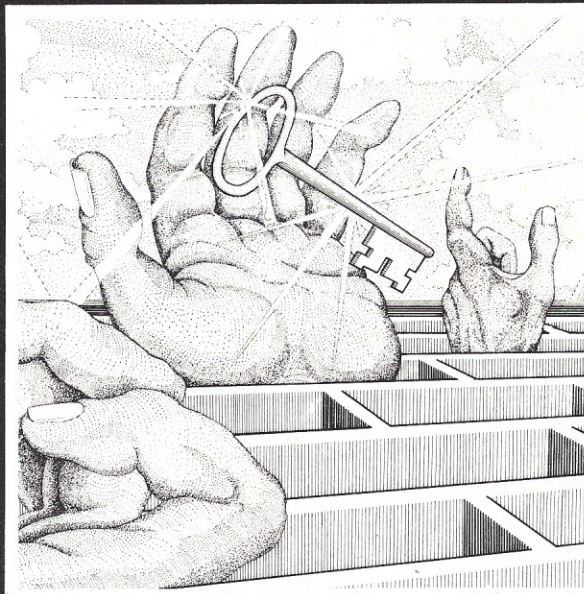
Before deciding to wait for these products to show up on American soil, consider how differently the Japanese see and do things. Michel Burton, a Yokohama-based computer marketing consultant, has lived in Japan six years. He spoke with some of the visiting Americans on how the Japanese do business.

Burton said that a Japanese employee is likely to spend his working life with one firm, but an American computer firm stands to lose about a fifth of its professional staff each year. So Japanese managers feel little pressure to get new products out in the market before they've been thoroughly developed. Japanese companies thus move slowly by American standards. You can't time Japanese product introductions with an American watch.

Slow or not, the success of a company like Toyota is typical of Japanese business. The firm sells a car devoid of new ideas, and auto-enthusiast publications find it difficult to write interesting reports on Toyotas. But every year the cars get better and a little more refined. Every year the car exhibits Ford prices and Mercedes reliability. It is safe to assume that Japanese computer companies will bring the same principles to the computer they sell here.

This puts the four-pound computer and such products at the Data Show into perspective. New products may appear at shows, but Japanese firms

THE KEY TO KNOWLEDGE



THE TIME DUNGEON (AMERICAN AND WORLD)

You find yourself in an unknown location deep within the catacombs of THE TIME DUNGEON, with nothing but 1,000 pieces of gold and your knowledge of American or World History. By mapping your way through the caverns in search of the crystal key, you try to escape with as much gold as you can. During your explorations you will encounter Alien Travelers who question you about American or World History. A correct answer results in more gold . . . but incorrect responses reduce your wealth!

There are two separate packages: THE TIME DUNGEON WORLD and THE TIME DUNGEON AMERICAN. Available for *TRS-80 cassette and †Apple Disk.

MOSTLY BASIC

Advanced Operating Systems has produced three packages designed to save you from the time and aggravation of program entry. We have taken the many useful programs from the highly popular Howard W. Sams book, MOSTLY BASIC, and recorded them for *TRS-80 cassette and †APPLE disk.

The three packages are HOUSEHOLD, EDUCATIONAL, and SCIENTIFIC and include a gas mileage calculator, language flash cards, digital dice, and many others. All 3 packages are available on *TRS-80 cassette and †APPLE disk.

Now available at your local software dealer, or call 1-800/348-8558 to order. MasterCard and VISA accepted. (Indiana residents, call 1-219/879-4693.)

Advanced Operating Systems

450 St. John Road
Michigan City, IN 46360

*TRS-80 is a registered trademark of Radio Shack, Division of Tandy Corp.
†Trademark of Apple Computer, Inc.

CIRCLE 41

Why use their flexible discs:

Athana, BASF, Control Data, Dysan, IBM, Maxell, Nashua, Scotch, Shugart, Syncom, 3M, Verbatim or Wabash

when you could be using

MEMOREX

for as low as \$1.94 each?

Find the flexible disc you're now using on our cross reference list... then write down the equivalent Memorex part number you should be ordering.

Product Family	Product Description	Memorex Part Number (2001-)	CE quant. 100 price per disc (\$)	Athana	BASF	Dysan	IBM	Maxell	Nashua	Scotch 3M	Shugart	Syncom	Verbatim	Wabash	Control Data
Flexible Disc 1s Single-Headed Drives Single-Density Media	IBM Compatible (128 B/S, 26 Sectors)	3060	1.99	473071	53428	800506	2305830	FD1-128	FD-1	740-0	S/A 100	15002	FD34-9000	F111111X	421802
	IBM Compatible (128 B/S, 26 Sectors) w/ W.P.N.	3062	2.04	—	—	—	—	—	—	740-0	—	—	FD34-9000	—	—
	IBM Compatible (128 B/S, 26 Sectors) w/ W.P.N. & Hub Ring	3064	2.39	—	—	—	—	—	—	—	—	—	FD34-9000	—	—
	IBM Compatible (128 B/S, 26 Sectors) REVERSIBLE	1729	3.19	473072	54431	—	—	—	FD-2	740-2-0	—	15150	FF34-9000	F171111X	—
	IBM System 6 Compatible	3066	2.04	473077	54561	800509	1669959	—	—	740-0-058	—	15003	FD60-9000	F161111X	—
	IBM Compatible (256 B/S, 15 Sectors)	3109	1.99	473073	—	800584	2305845	—	—	740-3600	—	15005	FD36-9000	F112111X	—
	IBM Compatible (512 B/S, 9 Sectors)	3110	1.99	473074	—	800585	1669954	—	—	—	—	15004	FD60-9000	F112111X	—
	Shugart Compatible, 32 Hard Sector	3015	1.99	470901	53802	10171	—	PH1-32	FD-132	740-32	S/A-101	15025	FD30-9000	—	421322
	Wang Compatible, 32 Hard Sector w/Hub Ring	3087	2.49	—	54691	—	—	—	—	740-309H	—	—	—	F374411X	—
	CPT 8000 Compatible	3045	2.69	—	—	—	—	—	—	—	—	15226	—	—	—
Flexible Disc 1d Single-Headed Drives Double-Density Media	IBM Compatible (128 B/S, 26 Sectors)	3090	2.69	474071	54568	37401D	—	FD1-128/M2100	FD-1D	741-0	—	—	FD34-8000	F131111X	423002
	Soft Sector (128 B/S, 26 Sectors) REVERSIBLE	3093	3.69	—	—	—	—	—	—	—	—	—	FD32-8000	F334411X	423322
	Shugart Compatible, 32 Hard Sector	3091	2.69	470801	54596	1017D	—	PH1-32D	—	741-32	S/A-103	15075	—	—	—
Flexible Disc 2s Double-Headed Drives Single-Density Media	Soft Sector (128 B/S, 26 Sectors)	3113	3.09	—	54428	800814	1766870	—	—	—	S/A-150	15153	FD10-4026	F121111X	—
	Soft Sector (256 B/S, 15 Sectors)	3106	3.09	473477	54226	800815	2736700	FD2-256D	—	742-0	—	15154	FD10-4015	F122111X	424612
Flexible Disc 2d Double-Headed Drives Double-Density Media	Soft Sector (Unformatted)	3102	3.09	473485	—	DY150	—	FD2-XDM	FD-2D	743-0	—	15103	DD34-4001	—	425002
	Soft Sector (128 B/S, 26 Sectors)	3115	3.09	—	—	—	—	—	—	—	S/A-150	—	—	—	—
	Soft Sector (256 B/S, 26 Sectors)	3103	3.09	473471	54325	800817	1766872	FD2-256D	—	743-0/256	—	15101	DD34-4026	F141111X	425002
	Soft Sector (512 B/S, 15 Sectors)	3114	3.09	473472	54479	800818	1669044	—	—	743-0/512	—	15100	DD34-4015	F145111X	425612
	Soft Sector (1024 B/S, 9 Sectors)	3104	3.09	473473	54485	800819	1669045	—	—	743-0/1024	—	15102	DD34-4008	F147111X	425602
	32 Hard Sector	3105	3.09	470851	—	1017D	—	PH2-32D	—	743-32	S/A-151	15125	DD32-4000	F344411X	425322
	Burnhough B-80 Compatible, 32 Hard Sector	3082	3.09	—	—	—	—	—	—	—	—	—	—	F344411X	—
	Soft Sector (1024 B/S, 9 Sectors) w/Hub Ring	3116	3.49	—	—	—	—	—	—	—	—	—	—	—	—
	Shugart Compatible, 32 Hard Sector	3181	3.39	—	—	—	—	—	—	—	—	—	DD32-4000	—	—
	Memorex 55i or Equiv. Drive Compatible	30712003	2.69	470851	—	FDV	—	—	FD-165	511-0	—	15028	FD65-1000	F611111X	—
Mini Flexible Disc 1s 5 1/4" Single-Headed Drives Single-Density Media	Soft Sector (Unformatted)	3401	1.94	475001	54256	104/1	—	MD1	MD 1	744-0	S/A-104	15300	MD525-01	M11A211X	441002
	10 Hard Sector	3403	1.94	475010	54257	107/1	—	—	MD 110	744-10	S/A-107	15325	MD525-10	M14A211X	441102
	16 Hard Sector	3405	1.94	475016	54258	105/1	—	MD1	MD 116	744-16	S/A-105	15326	MD525-16	M51A211X	441162
	Soft Sector (Unformatted) w/Hub Ring	3431	2.14	—	—	—	—	—	—	—	—	—	MD525-01	—	—
	10 Hard Sector, w/Hub Ring	3433	2.14	—	—	—	—	—	—	—	—	—	MD525-10	—	—
Mini Flexible Disc 1d 5 1/4" Single-Headed Drives Double-Density Media	Soft Sector (Unformatted)	3417	2.14	—	54646	104/1D	—	—	—	—	—	—	MD525-01	—	—
	10 Hard Sector	3418	2.14	—	54649	107/1D	—	—	—	—	—	—	MD525-10	—	—
	16 Hard Sector	3419	2.14	—	54652	105/1D	—	—	—	—	—	—	MD525-16	—	—
	Soft Sector (Unformatted) w/Hub Ring	3481	2.34	—	—	—	—	—	—	—	—	—	MD525-01	—	—
	10 Hard Sector w/Hub Ring	3483	2.34	—	—	—	—	—	—	—	—	—	MD525-10	—	—
Mini Flexible Disc 2d 5 1/4" Double-Headed Drives Double-Density Media	Soft Sector (Unformatted)	3421	2.59	—	54624	104/2D	—	—	—	—	S/A-154	—	MD550-01	—	—
	10 Hard Sector	3423	2.59	—	54627	107/2D	—	—	—	—	S/A-157	—	MD550-10	—	—
	16 Hard Sector	3425	2.59	—	54630	105/2D	—	—	—	—	S/A-155	—	MD550-16	—	—
	Soft Sector (Unformatted) w/Hub Ring	3491	2.79	—	—	—	—	—	—	—	—	—	MD550-01	—	—
	10 Hard Sector w/Hub Ring	3493	2.79	—	—	—	—	—	—	—	—	—	MD550-10	—	—
	16 Hard Sector w/Hub Ring	3495	2.79	—	—	—	—	—	—	—	—	—	MD550-16	—	—

Memorex Flexible Discs...The Ultimate in Memory Excellence

Quality

Memorex means quality products that you can depend on. Quality control at Memorex means starting with the best materials available. Continual surveillance throughout the entire manufacturing process. The benefit of Memorex's years of experience in magnetic media production, resulting, for instance, in proprietary coating formulations. The most sophisticated testing procedures you'll find anywhere in the business.

100 Percent Error Free

Each and every Memorex Flexible Disc is certified to be 100 percent error free. Each track of each flexible disc is tested, individually, to Memorex's stringent standards of excellence. They test signal amplitude, resolution, low-pass modulation, overwrite, missing pulse error and extra pulse error. They are torque-tested, and competitively tested on drives available from almost every major drive manufacturer in the industry including drives that Memorex manufactures. Rigid quality audits are built into every step of the manufacturing process and stringent testing result in a standard of excellence that assures you, our customer, of a quality product designed for increased data reliability and consistent top performance.

Customer-Oriented Packaging

Memorex's commitment to excellence does not stop with a quality product. They are proud of their flexible discs and they package them with pride. Both their packaging and their labeling have been designed with your ease of identification and use in mind. The desk-top box containing ten discs is convenient for filing and storage. Both box labels and jacket labels provide full information on compatibility, density, sectoring, and record length. Envelopes with multi-language care and handling instructions and color-coded removable labels are included. A write-protect feature is available to provide data security.

Full One Year Warranty — Your Assurance of Quality

Memorex Flexible Discs will be replaced by Memorex if they are found to be defective in materials or workmanship within one year of the date of purchase. Other than replacement, Memorex will not be responsible for any damages or losses (including consequential damages) caused by the use of Memorex Flexible Discs.

Quantity Discounts Available

Memorex Flexible Discs are packed 10 discs to a carton and 10 cartons to a case. Please order only in increments of 100 units for quantity 100 pricing. We are also willing to accommodate your smaller orders. Quantities less than 100 units are available in increments of 10 units at a 10% surcharge. Quantity discounts are also available. Order 500 or more discs at the same time and deduct 1%; 1,000 or more saves you 2%; 2,000 or more saves you 3%; 5,000 or more saves you 4%; 10,000 or more saves you 5%; 25,000 or more saves you 6%; 50,000 or more saves you 7% and 100,000 or more discs earns you an 8% discount off our super low quantity 100 price. Almost all Memorex Flexible Discs are immediately available from CE. Our warehouse facilities are equipped to help us get you the quality product you need, when you need it. If you need further assistance to find the flexible disc that's right for you, call the Memorex compatibility hotline. Dial 800-538-8080 and ask for the flexible disc hotline extension 0997. In California dial 800-672-3525 extension 0997.

Buy with Confidence

To get the fastest delivery from CE of your Memorex Flexible Discs, send or phone your order directly to our Computer Products Division. Be sure to calculate your price using the CE prices in this ad. Michigan residents please add 4% sales tax. Written purchase orders are accepted from approved government agencies and most well rated firms at a 10% surcharge for net 10 billing. All sales are subject to availability, acceptance and verification. All sales are final. Prices, terms and specifications are subject to change without notice. Out of stock items will be placed on backorder automatically unless CE is instructed differently. Minimum order \$50.00. International orders are invited with a \$20.00 surcharge for special handling in addition to shipping charges. All shipments are F.O.B. Ann Arbor, Michigan. No COD's please. Non-certified and foreign checks require bank clearance.

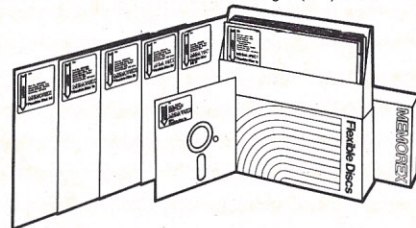
Mail orders to: Communications Electronics, Box 1002, Ann Arbor, Michigan 48106 U.S.A. Add \$8.00 per case or partial-case of 100 8-inch discs or \$6.00 per case of 100 5 1/4-inch mini-discs for U.P.S. ground shipping and handling in the continental U.S.A. If you have a Master Card or Visa card, you may call anytime and place a credit card order. Order toll-free in the United States. Call anytime 800-521-4414. If you are outside the U.S. or in Michigan, dial 313-994-4444. Dealer inquiries invited. All order lines at Communications Electronics are staffed 24 hours.

Copyright ©1981 Communications Electronics™



Order Toll-Free!
(800) 521-4414

In Michigan (313) 994-4444



For Data Reliability—Memorex Flexible Discs

COMMUNICATIONS ELECTRONICS™

Computer Products Division

854 Phoenix □ Box 1002 □ Ann Arbor, Michigan 48106 U.S.A.
Call TOLL-FREE (800) 521-4414 or outside U.S.A. (313) 994-4444

OUTLOOK

will deliberate and deliberate before the company's officers decide—as a group—to actively market those products here. They'd prefer to see them a success on the home market before selling abroad.

While the Japanese are deliberating the sale of computers in the U.S., American computers have achieved some popularity in the Japanese arena. Apples, TRS-80 personal computers and Commodore computers are available in Japan with Japanese characters and English letters together on the keys. There are also some corresponding changes in the hardware to support both character sets.

This implies that American and Japanese hardware are close in quality, and several Americans at the show said the technology was generally a toss-up as far as production machinery was concerned.

Not that American companies can just lean back. The Toyota of personal computers could be pretty devastating in the American marketplace. But the latter machine won't be obvious at a trade show. It's presence will be quietly felt in areas like reliability, cost-effectiveness, service and software availability.

Americans curious about seeing what the computer might be would be well advised to visit the Akihabara. This five-block square district of Tokyo is almost exclusively devoted to electronics and electrically driven devices, from shavers to washing machines to computers. There are literally dozens of computer stores in the Akihabara, all within walking distance of each other. Here you can see what makes and models are currently doing well in Japan. The most prominent machines are from NEC, Sharp, Hitachi, Casio, Fujitsu and from American makers like Apple, Commodore and Radio Shack.

Toshiba is already in this country with about a dozen dealers showing several computers aimed at small businesses, and it showed a small computer at the show that could be the beginning of a product line with wide appeal. Just when Toshiba's—or any other Japanese company's—management will decide to bring it to this country is problematical.

The bottom line? The Americans visiting the Data Show saw a number of machines which may be related to a number of computers you may be considering for your purchase-after-next, several years down the line. The handful of products that

Small Business Systems User!

WHEN BUYING CHECKS, STATEMENTS AND INVOICES — LOOK FOR THIS MARK:



ON THE DOOR OF YOUR COMPUTER STORE

DFS Computer Forms are

- Sold by a Local Business
- Satisfaction Guaranteed
- Available in Small Quantities
- Compatible with Existing Software
- Very Economical



P.O. Box 643 • Townsend, MA. 01469
NO. 37460

Wizard-80™

INSTANT 80 COLUMN APPLE*

The miracle of the 80's... everything you want in an 80-column card.

STOP STARING AT 40 COLUMNS

WIZARD-80 lets you see exactly what you will get when typing 80-column format. It gives you a full 80-column by 24-line display with all these features.

- Fully compatible with Apple II and Apple II Plus *
- Fully compatible with most word processors, micro-modems and prom programmers, plus all current Apple II expansion boards
- Lists BASIC programs, integer and Applesoft
- Fully compatible with Pascal
- Uses software to switch between 40 and 80 column formats
- Displays 7x9 matrix characters
- Provides upper/lower case characters with full descenders
- Fully edits... uses ESCape key for cursor movement
- Scrolling stop/start uses standard Control-S entry
- Retains text on screen while it is being printed
- Contains crystal clock for flicker-free character display
- Has low power consumption for cool reliable operation
- Leads soldered directly to board for maximum reliability
- 2K on-board RAM, 50 or 60 Hz operation
- Inverse video selection standard

WESPER MICRO Systems™
SUBSIDIARY OF WESPERCORP

*Registered trademarks of Apple Computer Inc



CIRCLE 44

\$345.00 AVAILABLE AT ALL FINE COMPUTER STORES

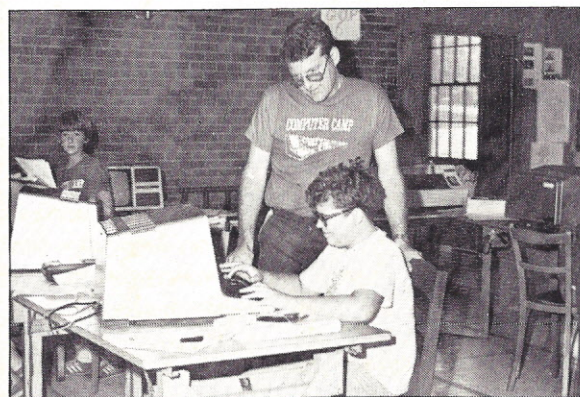
OUTLOOK

will be successfully imported to the U.S. will be very good indeed. Americans can look forward to the coming competition between Japanese and American companies being good for the average buyer.

So what's new from Japan?—refinements and possibilities.

What to do with the kids

This summer, youngsters can again sign up for a camp where the main activity won't be swinging a baseball bat or splashing in a pool, but rather experiencing computers. This unique recreational and educational experience will be held at two locations: Atlanta, Ga., and Simsbury, Conn. The camp is directed by Dr. Michael Zabinski, Professor at Fairfield University. Now in its fifth year, it is the original computer summer camp currently offered in the U.S.

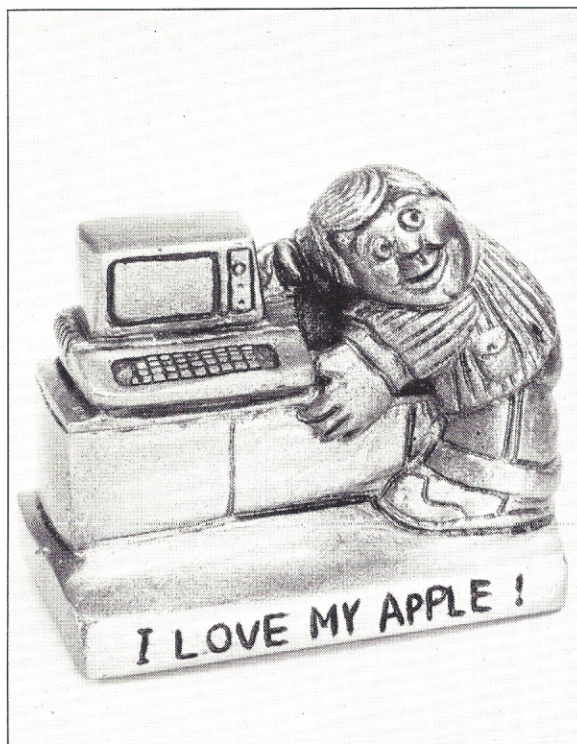


The 1982 National Computer Camp will feature sessions from July 11 to August 6. Campers, ages 10-18, may sign up for one- and two-week sessions. The campers will enjoy small-group instruction and dozens of computers for ample hands-on experience. Dr. Zabinski will be assisted by elementary- and secondary-school teachers, all with extensive classroom experience in computer instruction.

The camp is for kids of all levels of experience

including beginners. In addition to computers, the campers will enjoy recreational facilities such as swimming and tennis.

For further information call (203) 795-3049, or write to National Computer Camp, Box 624R, Orange, CT 06477.



For those who have everything

From Brian Productions comes this unique I LOVE MY APPLE computer sculpture. Perfectly detailed, this paperweight-conversation piece is actually a contemporary caricature of the computer buff and his favorite computer.

Other statues are also available: I LOVE MY SYSTEM/3, I LOVE MY IBM COMPUTER, I LOVE MY NCR COMPUTER and a plain model—I LOVE MY COMPUTER.

All statues are priced at \$9.95 each, postpaid, satisfaction completely guaranteed. Contact Brian Productions, 2949 Southfield Rd., Xenia, OH 45384.



Wizard-16K™

16K RAM APPLE MEMORY CARD

Unleashes your Apple II* and Apple II Plus* computer.

ON TO MAXIMUM MEMORY

Wizard-16K gives your 48K Apple II or Apple II Plus the last bit of directly accessible add-on memory it can accept. And, it interfaces with all Z80** cards to give you CP/M***.

- Fully compatible with Apple II and Apple II Plus
- Adds 16K bytes of Random Access Memory (RAM)
- Fully compatible with Z80 microprocessor cards for CP/M
- Used with Z80 card, it turns your Apple II into a two-microprocessor system with 56K of usable memory
- With a Z80 card, it lets you run BASIC-80****.

COBOL-80****, FORTRAN-80****, BASIC Compiler****, and Assembly Language Development System****, plus Applesoft BASIC*, Integer BASIC*, Apple Pascal System*, Apple FORTRAN* and Apple Pilot*

- Utilizes Apple DOS 3.3* 16-sector system to permit loading both Applesoft* and Integer BASIC*
- Compatible with VisiCalc*****
- Offers all features of Apple Language Card* (except Autostart RAM)
- LED indicators show which banks and functions are selected (deselected)

 **WESPER MICRO Systems™**

SUBSIDIARY OF WESPERCORP

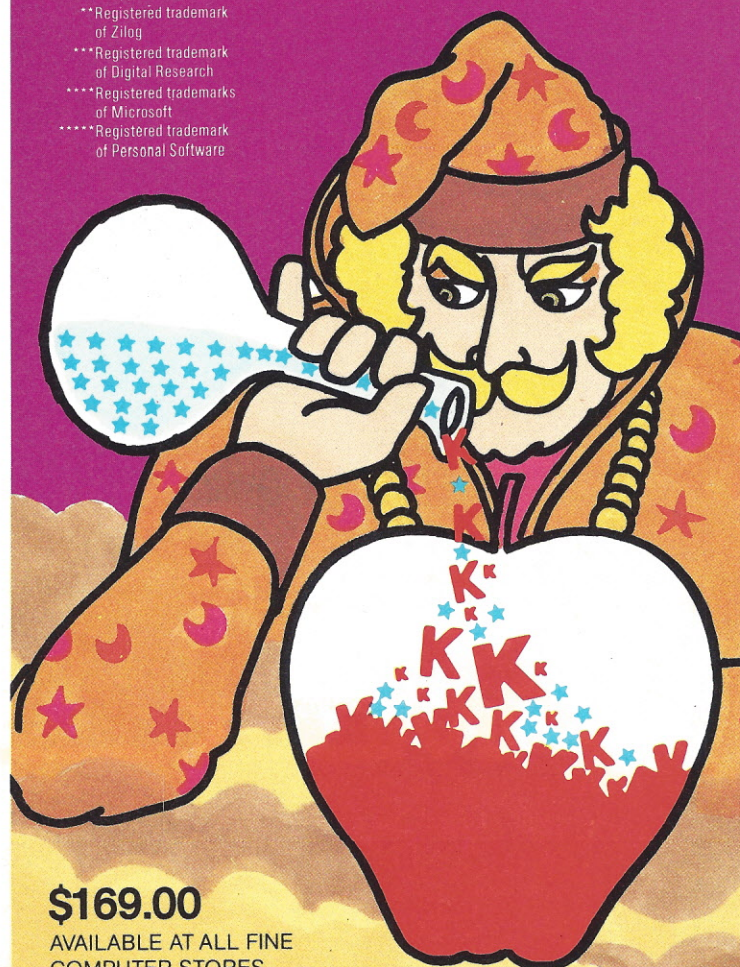
*Registered trademarks of Apple Computer Inc.

**Registered trademark of Zilog

***Registered trademark of Digital Research

****Registered trademarks of Microsoft

*****Registered trademark of Personal Software



\$169.00

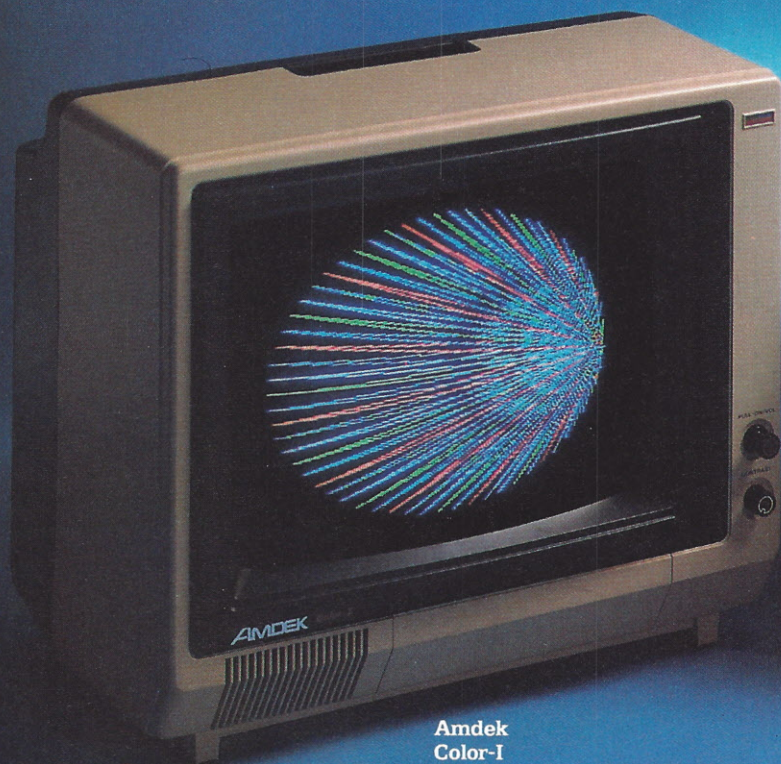
AVAILABLE AT ALL FINE
COMPUTER STORES

CIRCLE 45

Amdek

From picture perfect.

To letter perfect.



**Amdek
Color-I
FCC/UL approved**



**Amdek
Video-300**

At Amdek, we make monitors for people who demand state-of-the-art color. And for people who know that crisp, clear text display is an art in itself.

Our versatile Color-I 13" video monitor features standard NTSC composite input, front-mounted controls and a built-in speaker with audio circuit. Our popular Video-300 12" Green Phosphor monitor has an easy-to-read, non-glare screen, 18 MHZ band width and 80 x 24 character display.

Both offer easy portability, with lightweight cabinetry and molded-in handles. And both are fully

compatible with most computer and word processing systems. So compare our performance with other monitors. Then compare prices. For quality and value, you'll choose Amdek.

NEW THIS FALL: our advanced high resolution Color-II monitor with interface board for Apple II compatibility. Color-II features RGB, TTL input and 560(H) x 260(V) resolution for crisp 80 x 24 character display and exceptionally sharp color graphics. Ask your dealer about an Amdek Color-II, Color-I, or Video-300 monitor today.

AMDEK

2420 E. Oakton Street, Suite "E," Arlington Heights, Illinois 60005 (312) 364-1180 TLX: 25-4786

DEALER'S DIGEST

Selecting your computer and your computer dealer

Editor's note: The following column, written by personal-computer retailers, will appear periodically in Personal Computing in answer to our readers' requests for information on how to buy what, and from whom. Reader comments on successful ways to purchase, expand or upgrade a system are invited.

How are people buying personal computers these days? They're demanding quality. The mild recession experienced in 1980 has conditioned many shoppers to look for good value in their purchasing. Buyers have been stretching their expenditures by making more purchases of higher-quality products and less purchases of inferior products. Even the well-heeled customer will continue to seek quality and convenience at the "right price."

Smart consumption has replaced the conspicuous consumption of the 70s. And a predicted double-digit inflation rate of close to 14 percent in 1982 will veer many more consumers toward the value-seeking path. This shopping trend applies to all kinds of purchases, including personal computers.

Entering a computer store for the first time can be interesting, frightening and informative. It is interesting because computers have become a major factor in business, government and education. The computer is able to do work in minutes that used to take years. Millions of pieces of information move across oceans and continents in a matter of minutes. Computers can open doors that would have otherwise remained closed for centuries.

Although interesting, initial visits to computer stores can be frightening as well. A friend of mine was upset by the treatment he received at some of the computer stores around town. He was particularly horrified at a specific shopping experience: Upon entering a store to inquire about a computer for his home, he found a salesclerk

at the counter midway through a submarine sandwich. The salesperson refused to interrupt his lunch. Instead, he gestured toward a Commodore model stating, "That one over there is the best one for you." Needless to say, this was a frightening experience.

Most computer stores have very neat, courteous and well-informed personnel, who will ask many questions to find out what your requirements are. But most buyers are intimidated when asking questions that they feel are stupid; hence, they might not ask them.

Consumers must remember that buying the right computer to get a job done is far more important than being afraid of asking the right questions. You must ask questions to fully understand what your needs are, and what the capability and expandability of the computer you're intending to buy is.

Visiting a computer store is also very informative. Computers have keyboards and buttons, things called modems, printers and interfaces—all of which raise a lot of questions to the uninformed. All of these questions should be fully explained to your satisfaction before you say, "I'll take it."

The number of computer dealers has skyrocketed. Estimates of the numbers run as high as 3000 to 4000—up three times from a year ago—and are expected to double again this year. In addition to the specialty computer dealers, department stores, big national chains, audio merchants and discount appliance houses are jumping on the fast

DEALER'S DIGEST

moving, high-volume computer bandwagon.

How to buy

The best way I found to buy something is to shop for it. Shopping takes time and effort, but the justification is in the reward. When you shop for a major purchase, look for three basic

things: selection, service and price.

- **Selection:** Being informed of technological breakthroughs, manufacturers' promotions and strategies, along with just plain knowing who's selling what, keeps the successful buyer on top of the buyer's market. How can you do this? Keep abreast of the personal-computer

market by reading about it.

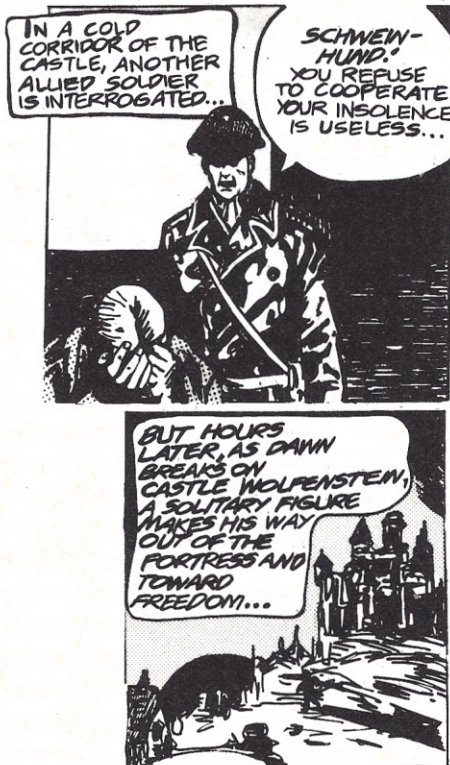
- **Service:** This can be one of the most frustrating experiences of buying. Now you've bought it. You know what to do with it, you're ready to use it, but it doesn't work. This is when service from your dealer really counts. Can he fix it, or do you have to find a big box, pack it up and haul it over to the post office or the nearest truck driver? Do you send it half-way across the country to wait six to 10 weeks to find out it still doesn't work?

The man who sold you the computer should also be the man who will fix it if it breaks. He is your computer specialist. He made the profit on the sale, and he should therefore ease any pains that go along with it. Down time can be very costly and can be avoided by having access to a qualified service center.

- **Price:** "You get what you pay for." If you do your homework and are up to date on what you're buying, you should be able to buy it at the right price. Catalog houses give you the right price, but offer no help, selection or service. Elite computer stores offer selection and service, but the price is often off the wall.

By visiting enough stores you will learn what to buy and from whom you should buy it. Allow your computer dealer to make a fair profit and he will do all that he can to help you now and in the future. He wants your business, and more importantly, he needs it to survive. Referrals are the best sales leads because they are a personal recommendation. A dealer will do all he can to get them.

Remember that a personal computer is an investment in equipment. You get out of it what you put into it. Therefore, make sure you select the right one, you can get it fixed and you pay the right price. 



CASTLE WOLFENSTEIN™
by Silas Warner

For Apple II or Apple II Plus with 48K,
\$29.95

MUSE SOFTWARE™

330 N. CHARLES STREET
BALTIMORE, MD 21201
(301) 659-7212

Call or write for information and
the name of your nearest MUSE dealer

Apple II is a trademark of Apple
Computer Corp.
© MUSE Software, Inc.

Michael De Martino is vice-president of Comtek Electronics, a New York City four-store retail chain.

OTHERS MAY SEE THE ERRORS OF YOUR WAYZ.

ONLY MICROSPELL CORRECTS THOSE WAYS.

Lifeboat Associates, the world's foremost source for microcomputer software, proudly presents MicroSpell,[™] the first program that not only isolates spelling errors in your text, but actually corrects them.

MicroSpell works with your word processor. And if you have the best word processing system, why settle for anything less than the best spelling corrector?

Goes Beyond The Competition

Other spelling programs function primarily as spelling checkers, merely pointing out words with suspect spelling. It's left up to you to determine the correct spelling and then type it in.

MicroSpell, the only spelling program that knows how to "spell," corrects the error automatically. Here's how it works: MicroSpell will read your text, carefully looking for words that might be spelled incorrectly. When it comes across a word that it's not absolutely sure of, it stops and shows you that word, along with its context. Then it searches through its own built-in dictionary and presents a list of guesses which it "thinks" might be correct. All you have to do is press a key and the misspelled word is corrected. There is no

need to bother with your own dictionary, or even to type in the change. MicroSpell will do it all for you!

The Most Complete Built-In Dictionary

MicroSpell uses word stems and suffix stripping routines, so its dictionary of 25,000 word-parts can deliver over 150,000 words to you. And if that's not enough, MicroSpell will let you add thousands of additional words, so you can create and store specialized dictionaries of technical terms, unusual expressions, even acronyms. And you can let MicroSpell know just when any of these special dictionaries are wanted.

MicroSpell is highly interactive and designed to complement word processing systems that create ASCII text using a CP/M[®] compatible operating system. It requires minimum disk storage capacity of 70K per drive.

So why settle for a program that merely finds your *mispellings* when you can get the one that corrects your *misspellings*? MicroSpell. It corrects the errors of your ways.

MicroSpell is brought to you exclusively and supported completely by Lifeboat Associates. Call or send us the coupon below.

LIFEBOAT WORLDWIDE offers you the world's largest library of software. Contact your nearest dealer or Lifeboat:

Lifeboat Associates
1651 Third Ave.
New York, N.Y. 10028
Tel: (212) 860-0300
Telex: 640693 (LBSOFT NYK)
TWX: 710-581-2524

Lifeboat Inc.
OK Bldg., 5F
1-2-8, Shiba-Daimon
Minato-ku, Tokyo 105, Japan
Tel: 03-437-3901
Telex: 2423296 (LBJTYO)

Lifeboat Associates, Ltd.
PO Box 125
London WC2H 9LU, England
Tel: 01-836-9028
Telex: 893709 (LBSOFTG)

Lifeboat Associates GmbH
Hinterbergstrasse
Postfach 251
6330 Cham, Switzerland
Tel: 042-36-8685
Telex: 865265 (MICO CH)

Intersoft GmbH
Schlossgartenweg 5
D-8045 Ismaning, W. Germany
Tel: 089-966-444
Telex: 5213643 (ISOFD)

Lifeboat Associates, SARL
10, Grande Rue Charles de Gaulle
92600 Asnieres, France
Tel: 1-733-08-04
Telex: 250303 (PUBLIC X PARIS)

Mail coupon to: Lifeboat Associates,
1651 Third Avenue, New York, New York 10028
or call (212) 860-0300.

- ☐ Please send me more information on MicroSpell.
☐ Please send me a free Lifeboat catalog.

Name _____ Title _____

Company _____

Street _____

City _____ State _____ Zip _____

MicroSpell is a trademark of Bob Lucas.
CP/M is a registered trademark of Digital Research.
Copyright © 1981, by Lifeboat Associates

3208

#1 Lifeboat Associates
World's foremost software source

**SOFTWARE
WITH
FULL
SUPPORT**

The ZX81: upgraded computing power

Situating his product at the low end of the personal-computer market, Clive Sinclair, president and founder of Sinclair Research, has come out with an updated and upgraded ZX81.



Shown with the optional 16k RAM module is the Sinclair ZX81. The basic unit is priced at under \$150 in complete form and under \$100 in kit form.

Sinclair says his low-priced personal computer, which was introduced at a recent Boston press conference, is aimed at the "man in the street."

He describes the average user of his system as "a person who wants to learn what computers are about, not necessarily because he's going to use them (computers) personally. . . It's because he wants to understand how they work."

What Sinclair is describing is the new version of last year's low-priced ZX80. The older unit had come

under criticism from some quarters as having a limited display capability. The new version, which features an 8k basic ROM and is based on a Z80A 8-bit central-processor unit, will now compute and display at the same time, whereas the older unit could not.

The ZX81, which weighs about 12 ounces, takes advantage of very large-scale integration in the new master chip. This new CPU chip, developed by Ferrante in Britain, has enabled Sinclair to replace 18 chips. There are now only four in the unit.

It is not available with any dedicated video-display unit. Instead it relies on a built-in VHF rf demodulator to interface with a standard black-and-white television set. The display, which has graphics capability built around the TV's raster scan, is 24 lines with 32 characters per line. It can either be standard or reverse video.

Because it relies on this interface mode between the CPU and the display, the computer's line length is limited. It is based on the existing bandwidth of the television set. This interface should be more than adequate for the beginner, at whom Sinclair is apparently aiming.

The system can be upgraded with the addition of a 16k RAM module, which costs \$99.50. It is also available in either kit or assembled form. The kit lists for \$99.50, while the completed unit lists for \$149.95.

Sinclair sees the potential sales market for this unit in the U.S. as about the same as it is in the United

Kingdom, 20,000 a month.

One drawback many persons accustomed to typewriter keyboards may find is the plastic membrane keyboard this unit uses. Other computer manufacturers, such as Commodore and Texas Instruments, have tried this type of keyboard, but have met with little success. Those companies eventually changed to a full-featured keyboard. As one observer noted, this is one way to keep the cost of the unit down.

The pressure-sensitive 40-key keyboard does have the equivalent of 91 built-in functions. It also features single-stroke entry for such functions as peak, poke, list and run, which should make this computer an easy instrument for the beginner to use.

There is also a 164-page BASIC instruction manual available for the user who wants to learn programming.

Sinclair says that thanks to its extensive work with the British school system, where there are some 2500 ZX81s in use, an extensive foundation of educational software has been built.

The ZX81 has two operating speeds, normal and fast, which is four times the speed of normal. At the normal speed, the unit computes and displays simultaneously. This allows the user continuously moving graphics capability.

There will also be a low-priced printer available for the ZX81 sometime early in 1982. Priced at about \$99, this will be the only printer available for the ZX81. Sinclair says



Every Apple Is Created Equal. But It Doesn't Have To Stay That Way.

An Apple™ is really something. But from now on, it's going to be something much more. How come? Simple. We're introducing three revolutionary new data communication packages, called Transend™, designed especially to make your Apple II™ rise above all others.

Our Transend data communications software provides access to information utilities; complete file transmission of charts, VisiCalc™ reports, and entire programs; as well as all electronic mail functions.

Transend comes in three different versions. You can begin economically with the simplest form, Transend 1, an intelligent terminal/file transfer system. As your needs increase, you can move up to two other Transend packages, without worrying about retraining or repurchasing. Transend 2 gives any Apple II intelligent terminal capabilities, plus file transfer with complete error detection and

automatic retransmission for demanding business applications. Transend 3 incorporates electronic mail—with password security, text editing, mailbox with mailstop, unattended scheduling and receiving, automatic redialing, and much more.



Transend's support of most popular Apple II "add-in" cards and modems lets you upgrade your Apple without hassle or unnecessary expense. And you'll immediately cut operating costs by as much as 30% with simple, easy-to-use menus, data compression and 1200-baud modem support.

Nobody on the personal computer scene today is offering the speed, flexibility, and reliability of Transend in a single upgradable software system.

Don't miss this chance to uplift your Apple II. Contact us or your dealer for all the delicious details.

SSM Microcomputer Products, Inc.,
2190 Paragon Drive, San Jose, CA
95131, (408) 946-7400, Telex: 171171,
TWX: 910-338-2077.

SSM
The Transformation People

CIRCLE 49

Apple and Apple II are trademarks of Apple Computer, Inc. VisiCalc is a trademark of Personal Software, Inc. And Transend is a trademark of SSM Microcomputer Products, Inc.

Turn your TV into a time-sharing videotex display for \$399.*

Now you can connect your family to the informative and entertaining world of CompuServe, The Source, Dow Jones News/Retrieval and other time-sharing and data-base networks.

All you need is the RCA VP-3501 Videotex Data Terminal (with built-in modem and RF modulator), your telephone and your TV set. You can get instant access to regional newspapers and newsletters...weather reports and sports results...computer games and more. You can use the VP-3501 to make airline reservations...find restaurant recommendations in cities around the world. Plus stock market and corporate data. Or access your school or business computer. You can even send electronic mail and buy products.

In addition to information retrieval, the VP-3501 provides full interactive communications with a host computer. What you have working for you is a versatile, feature-packed interactive data terminal which can be worth far more to you than its low price. Its unique color-locking circuitry gives you sharp color graphics and rainbow-free characters. You get 20- and 40-character formats in one of eight foreground colors and separate color backgrounds.

With reverse video, you can emphasize certain letters, words, or sentences. A built-in tone generator...plus a white noise generator...let you create everything from the sound of explosions to the sound of music. The spill-proof, easy-to-clean keyboard is highly suitable for hostile environments. And its membrane key switches give you a natural feel.

The VP-3501 is truly a fine Videotex Data Terminal. And don't forget, it's made by RCA...the first name in television...now the foremost name in videotex terminals.

See a demonstration at your computer or electronics dealer, or contact RCA. Order now and you'll get a free password and a free hour's time-sharing on both CompuServe and Dow Jones News/Retrieval! (Limited time offer.)

For more information or to order, call toll-free. 800-233-0094. (In Pennsylvania, call 717-393-0446.) Visa or MasterCard orders accepted by phone. Or send a check including \$3.00 delivery charge plus your local sales tax to RCA MicroComputer Products, New Holland Avenue, Lancaster, PA 17604.

**Suggested User Price.*

HARDWARE

that his company would prefer users to stay with his printer rather than go elsewhere. It is a 50-character-per-second unit which is capable of printing either the contents of the screen or the data that has been filed.

The upgraded computing power that has been incorporated in the ZX81 also allows multidimensional string and numerical arrays. Capable of mathematic and scientific functions, the ZX81 stores numbers in 5 bytes in floating-point binary form. The company says the math function is accurate to $9 \frac{1}{2}$ digits and the computer can perform full-log, trigonometric and inverse functions.

Program loading is done through an integral serial I/O port which can be linked to a standard cassette recorder. A user can write, load and save his own programs, or he can use any of the six programs that Sinclair has available for \$9.95 each. There is no provision for the faster disk-type of program load. Users are limited to the slower cassette, even though the system will serially search a cassette for a specific program. Users can assign the programs specific names.

Some of the other functions included in the basic ZX81, which has 1k of static memory, include editing and automatic syntax checking of every statement line.

A compact unit, $6 \times 6 \frac{1}{2} \times 1 \frac{1}{2}$ inches, this personal computer is a little larger than an ordinary book. Although it is priced inexpensively, Sinclair claims it is a full-featured system. It is "not a reduced-support machine. The language it uses is complete," he states.

The company can keep costs down because it does only the tooling, development, technology and design work in-house. The manufacturing is done by outside contractors, such as Timex in Dundee, Scotland. Although Sinclair is expanding its software library, the company encour-





The New AIO-II.

Another winner from the folks who invented multi-function Apple interfaces.

SSM is still ahead of the game when it comes to the Apple II™. Choose from any of four operating modes. And you're assured of flexibility at a price that spells big savings.

Check out why SSM spells success:

THE NEW SERIAL/PARALLEL AIO-II: this new full-function serial and parallel interface for the Apple II gives you true simultaneous operation. It's totally transparent to the user; there's no software to write, and no need to modify your computer. Advanced design techniques overcome the need for "phantom" slot assignments and related software compatibility concerns.

The AIO-II™ appears to application software as either an Apple communications card or parallel printer card. You don't have to worry about special setup requirements. Hassle-free, user-oriented AIO-II design permits easy selection of four functions: serial modem, serial terminal/printer, parallel Centronics printer, and general-purpose

parallel. On-board firmware provides all necessary drivers in a single package. Optional cables support Centronics-compatible printers and others.

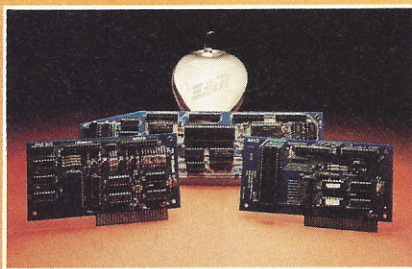
You can remain in the game, too, with either our Serial ASIO™ or Parallel APIO™ boards—if low cost, single function's your style. Our ASIO connects your Apple to a modem with an optional terminal routine, or to a terminal/printer without modifying the cable. It

gives you standard RS-232 interface with complete handshaking. And selectable rates from 110 to 9600 baud. The APIO parallel interface supports general-purpose I/O and all popular Centronics-compatible printers, including Epson, IDS, Okidata, Anadex, and others.

All our game-winning boards are designed to make your Apple more productive. Optional software support is available for Apple Pascal and Microsoft CP/M™.

Whether you're an OEM or end user, we can deliver any quantity you specify. Fast. For the latest word on any of these interface boards, or our newly enhanced A488™ (the industry's highest performance IEEE-488 controller), see your local dealer, or call us today.

SSM Microcomputer Products, Inc.,
2190 Paragon Drive, San Jose, CA
95131, (408) 946-7400, Telex:
171171, TWX: 910-338-2077.

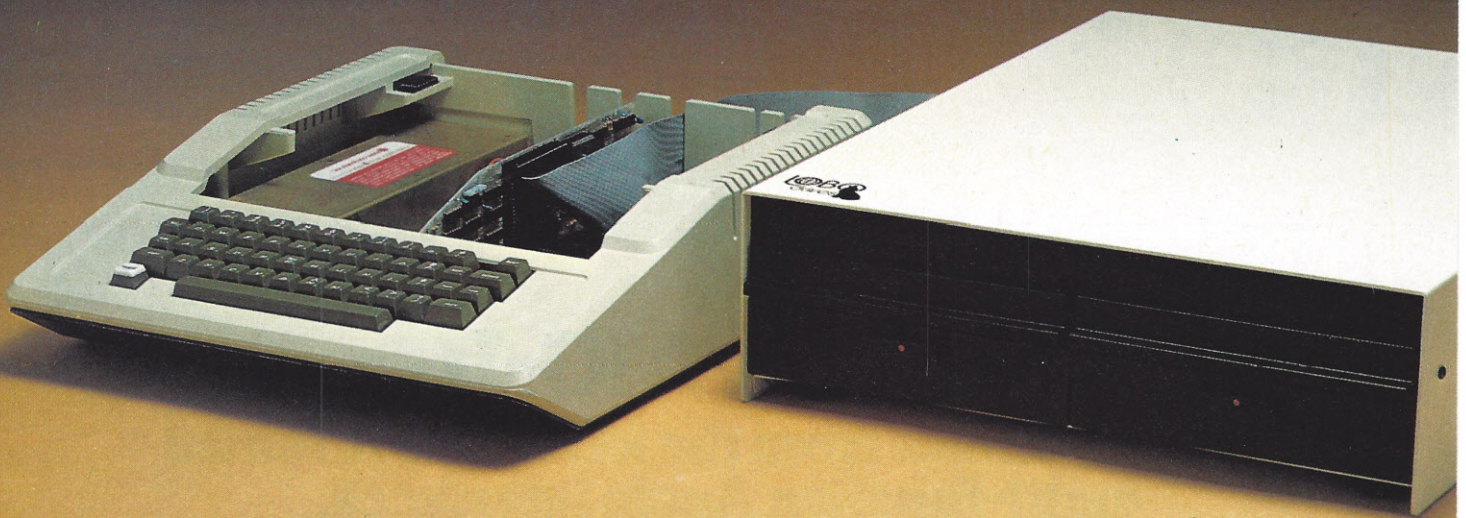


The Transformation People

CIRCLE 50

Apple and Apple II are trademarks of Apple Computer, Inc. CP/M is a trademark of Digital Research. AIO-II, ASIO, APIO and A488 are trademarks of SSM Microcomputer Products, Inc.

4.4 MEGABYTES FOR YOUR APPLE



Double-Sided, Double-Density 8-Inch Drive Capability is Here ... Now!

The new LOBO DRIVES Model LCA-22 Double Density Floppy Disk Controller has been specifically designed to match your APPLE® to the new double-sided, double-density 8-inch floppy disk drives. Now, you can add up to four 1.1 Megabyte drives (4.4 Megabytes total) and realize all the power and potential of your APPLE computer.

Completely Software transparent, the Model LCA-22 will plug into any chassis slot. You are no longer restricted to slot 7. And, the Model LCA-22 is fully compatible with 3.3 DOS and PASCAL. CP/M will be available soon.

LOBO's new LCA-22 Disk Controller and full line of field-proven, high-reliability disk drives (all LOBO products come with a one year, 100% parts/labor warranty) are available at computer retail stores nationwide. Stop in and see a demonstration at your local dealer today.



LOBO DRIVES INT'L
354 South Fairview Ave.
Goleta, CA 93117
(805) 683-1576

I'm looking to expand my APPLE. Please send me more information on:

- | | |
|---|--|
| ☐ Model LCA-22 Disk Controller | ☐ Fixed Disk Drives |
| ☐ Floppy Disk Drives | ☐ 5¼-inch |
| ☐ 5¼-inch | ☐ 8-inch |
| ☐ 8-inch | ☐ 14-inch |

Name _____

Address _____

City _____ State _____ Zip _____

Phone _____
(area code)

HARDWARE UPDATE

ages outside software houses to write programs for the ZX81.

Sinclair normally markets its products by direct mail. But a retail chain in the United Kingdom and American Express have also recently begun to sell these computers.

Service is still handled by mail

with this Boston, Mass., and Cambridge, England-based company. Kit buyers should be aware that normal warranty procedures don't cover kit computers.

The unit comes complete with all of the necessary interface connectors for the video and cassette con-

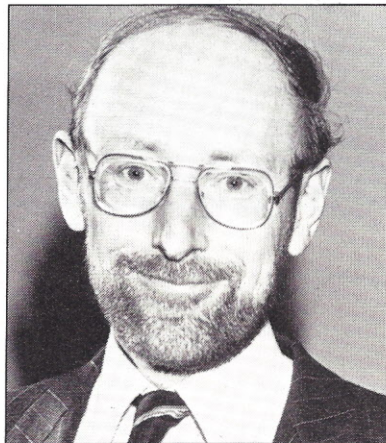
nections. It also comes with an AC adapter. The in-house programs available include business and household management, math and spelling education and games.

For more information: Sinclair Research, One Sinclair Plaza, Nashua, NH 03061. **CIRCLE 150**

The man behind the ZX81

Clive Sinclair, founder and president of Sinclair Research, could well be called a Renaissance man. He is the developer of the ZX81, although his formal education ended with his graduation from high school in Britain.

Self-taught in electronics, Sinclair began his career as a technical journalist in Britain. He spent four years in this field before he branched out and formed his own company, Sinclair Radionics. This firm dealt with radio kits.



It was from this firm that Sinclair began his career of

"technological firsts." He was able to push ahead with an idea. From this idea, the world's first pocket calculator was born in 1972.

Still in his 30s, Sinclair again broke new ground with the introduction of the ZX80 personal computer. It was the first on the market for under \$200.

Sinclair formed Sinclair Research in the late 1970s and has spent the last couple of years designing not only the 80, but now the 81, which is built by Timex in Dundee, Scotland.

DISASTER INSURANCE.

**PROTECT YOUR HARDWARE
FROM THE UNEXPECTED.**

Not to mention the unavoidable pollutants in the air. Performance robbing dust, grime, spills and static electricity.

Cover Craft Dust Covers help extend the useful life of your computer equipment at a fraction of the cost. Perhaps that's why more people throughout the world rely on Cover Craft Dust Covers than any other brand.

Visit your local dealer or contact Cover Craft.

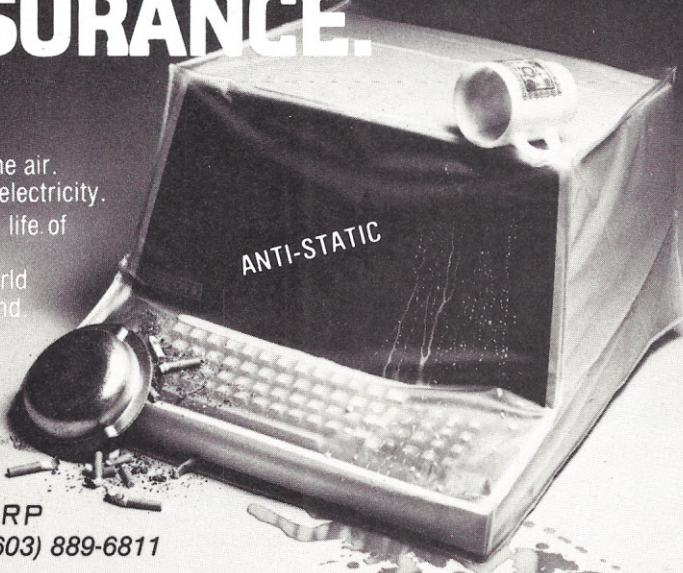
Dust Covers for most terminals, disks, printers, modems, etc.

\$8.95-\$15.95
Shipping extra.



COVER CRAFT CORP

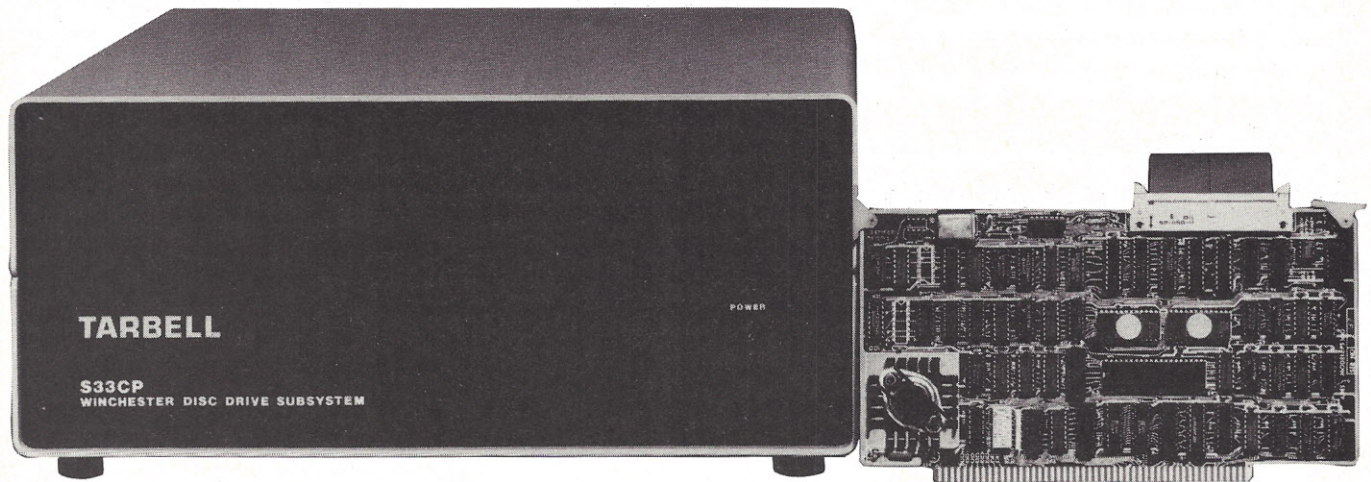
PO Box 555, Amherst, NH 03031 • (603) 889-6811



CIRCLE 52

S-100 Computer Owners...

Looking for more capacity, speed and reliability?



Tarbell 33 megabyte winchester subsystem

CAPACITY

Are you finding you need more disk memory for business applications? Tarbell's hard disk subsystems allow expansion from 10 to over 200 megabytes. And our ATTACH program provides a way to get up-and-running quickly. Start with a small system, if you like, then add up to four drives of any capacity.

SPEED

In most business applications, speed of the disk subsystem is the limiting factor for overall system speed. Major factors which affect disk speed are access time and data transfer rate. All Tarbell hard disk subsystems 33 megabytes and above use a voice-coil actuator which provides an average access time of 50 milliseconds. Data comes off the disk into your deblocking buffer at the maximum possible speed of 1 megabyte per second, meaning that a 24 kilobyte file can be loaded into memory in about one second!

RELIABILITY

Winchester drives have higher inherent reliability because the media and heads are in an air-sealed environment. Other types of drives are open to contamination from smoke, chemicals, and other particles in the air.

ADDITIONAL FEATURES

- Uses only one S-100 board slot
- On-board CRC performed on data
- Automatic alternate sector assignment
- 512-byte on-board deblock buffer

Subsystem includes S-100 interface, drive, cabinet, power supply, cables, software, and all documentation.

Tarbell
Electronics

**MANUFACTURER OF COMPUTERS,
COMPONENTS AND SOFTWARE**

950 Dovlen Place
Suite B
Carson, CA 90746
(213) 538-4251

HARDWARE UPDATE

A new Apple in the bushel

A more powerful version of the Apple III, with expanded mass-storage capability and application programs, features an improved operating system, more reliable hardware, seven new or enhanced software packages and a lower price than the earlier product. Apple III also supports up to 256 kbytes of internal memory.

The expanded storage capability is provided by Apple III/ProFile Personal Mass-Storage System. When integrated into Apple III systems, ProFile is a five-million-byte,

Winchester-type, hard-disk system which gives Apple users nearly 35



times the mass-storage capacity of a single floppy disk.

"The new Apple III/ProFile com-

bination is an important development in our efforts to bring versatile and dependable hardware and software solutions to professional personal-computer users," says A.C. Markkula, Apple president.

Markkula says that tests indicate that the new Apple III is even more reliable than the Apple II. The Apple III proved more reliable in simulated customer-environment use and in an on-going "out-of-box" quality-control audit from finished stock.

Apple III is targeted at customers in business, professional manage-

utility city

21 of our most-asked-for Apple Utilities
by Bert Kersey 48K Applesoft ROM

For YOUR Big Apple—Our 21 most-asked-for Apple Utilities on one big disk—List Formatter makes properly spaced & indented listings with printer page breaks. Each program statement is on a new line with If-Then's & Loops called out, a great de-bugger! Catalog in any number of columns & any page-width to CRT or printer. Automatically post the Run-Number & last-used Date in your programs. Make any command invisible in your listings; Access program lines in memory for garbage repair & "illegal" alteration; Quickly sort & store info on disk; Run any Applesoft file while another stays intact; Rename to 65535; Save inverse, INVISIBLE & trick file names. Convert dec to hex & binary, or INT to PP. Append programs; dump the text screen to ANY printer... More too! 21 Programs Total!

PLUS... APPLE TIP BOOK NUMBER THREE!
40 PAGES of new tips, tricks & articles—"DOS Trickery," "Copy Stoppers," "Programming the Reset Key," & much more. Plus understandable explanations of how each U-City Program works—One of the best Apple learning tools on the market today!

\$29.50 (+\$1.50 Shipping)
✓ Utility City on Applesoft Disk.
✓ Beagle Bros Apple Tip Book #3
✓ Apple PEEKS, POKES & POINTERS Chart

alpha plot

Hi-Res Apple Graphics/Text Utility
by Bert Kersey & Jack Cassidy 48K REQUIRED

HI-RES DRAWING: Create hi-res pictures & charts, appendable to your programs. Keyboard or Paddle control; Optional Xdraw Cursor (see lines before you draw!); Any color mix or REVERSE (opposite of background); Circles, Boxes & Ellipses, filled or not. Bonus Programs too—SCRUNCHER stores hi-res in as little as 1/3 normal disk space. SHIFTER transfers any portion of the hi-res screen. Also superimpose hi-res images and convert Hi-Res to Lo-Res & back for fascinating abstracts!

HI-RES TEXT: Beautiful upper & lower case with Descenders; color or reverse; Positionable anywhere (NOT restricted by tabs & Vtabs). Professional looking PROPORTIONAL SPACING! Adjustable Type Size, Leading (line spacing) & Kerning (letter spacing). Multi-directional typing; up, down, even backwards!

PLUS... APPLE TIP BOOK NUMBER FOUR!
40 PAGES of tips for making the most of your Apple's advanced graphics capabilities. Alpha instructions plus shape table tips, new tiling & color tricks and fascinating animation experiments!

\$39.50 (+\$1.50 Shipping)
✓ Alpha Plot on Applesoft Disk.
✓ Beagle Bros Apple Tip Book #4
✓ Apple PEEKS, POKES & POINTERS Chart.



Beagle Bros
MICRO SOFTWARE

NEW Apple Utility Disks!

With Free PEEKS & POKES Wall Chart!

4315 Sierra Vista
San Diego,
CA 92103
714-296-6400

WITH EACH ORDER, YOU WILL RECEIVE...
☐ Dos Boss, Utility City or Alpha Plot on Applesoft Disk
☐ A 40-page Apple Tip Book (each entirely different)
☐ An 11x17 Apple PEEKS, POKES & POINTERS Chart

dos boss

DISK COMMAND EDITOR

by Bert Kersey & Jack Cassidy

A classic utility you will ENJOY! Rename Commands: "Catalog" can be "Cat," etc. Save-Protect your programs; Unauthorized copy attempts produce "Not Copyable" message. 1-Key Program Selection from catalog (extremely handy!). Catalog Customizer—Change Disk Volume message to your title; Omit or alter file codes; Catalog by file type, etc. Rewrite Error Messages—"Syntax Error" can be "Oops!" or anything you want!

All of Dos Boss's change features may be appended to your programs, so that anyone using your disks on any Apple (booted or not) will be formatting DOS the way you designed it!

PLUS... APPLE TIP BOOK NUMBER TWO!
With valuable DOS information: "Poking Around in DOS," "Making Programs Uninstallable," "Two-Sided Disk Tips," "Care of Your Drives," "Creative Peeking & Poking," "3.2 vs 3.3," etc.

ONLY \$24. (+\$1.50 Shipping)
✓ Dos Boss on Applesoft Disk.
✓ Beagle Bros Apple Tip Book #2
✓ Apple PEEKS, POKES & POINTERS Chart.
MINIMUM 32K REQUIRED

AT YOUR APPLE DEALER NOW, OR ORDER BY PHONE AT ANY HOUR... TOLL FREE!

Ask around about Beagle Bros Software. Our programs are practical, friendly & user-oriented, and always come with an amazing amount of documentation & juicy Apple information. If your dealer doesn't have our stuff, get on his case about it, or order directly from us. We ship all disks & books WITHIN 48 HOURS.

PEEKs, POKEs & POINtERS (not available separately)

BONUS WITH EACH DISK!
POKE your Apple all night long with this handy 11 x 17 reference poster! The most useable PEEKS, POKES, POINTERS & CALLS scrounged up from every source imaginable! A great companion to our original Apple Command Chart.

24 hour TOLL FREE Order Desk:

MasterCard, VISA or COD orders, call:

Nationwide: **800-854-2003** ext. 827

California: **800-522-1500** ext. 827

Alaska/Hawaii: **800-854-2622** ext. 827

(Orders only please. Questions, phone 714-296-6400. COD orders, add \$3.)

Or order by mail (use this coupon or separate sheet)

RUSH! The disks checked below
Plus The Tip Book and PEEKS & POKES Chart!

☐ UTILITY CITY (\$31) ☐ ALPHA PLOT (\$41) ☐ DOS BOSS (\$25.50)

(Prices include First Class Shipping; Calif. residents add 6%.) Specify:

NAMES= ☐ 3.2 ☐ 3.3

ADDRS=

CITYS= ZIP=

Mail U.S. check, money order or Visa/MC Numbers to: **BEAGLE BROS, Dept. P**

4315 Sierra Vista,
San Diego, CA 92103

Telephone (714) 296-6400.

Please add \$4.50 for shipping outside US or Canada. COD orders, add \$3. California residents, add 6%.

HARDWARE UPDATE

ment and education. Because of its increased mass-storage capacity, the new Apple III is also suited for OEMs and system integrators who need larger data-storage capacity.

Software solutions

The usefulness of the system is expanded by seven new enhanced application programs. One program, Access III, allows Apple III computers to communicate with large mainframes, and for the first time, to be used as remote data-processing workstations, accessing information from the larger data base and returning completed work to the central computer.

Other new or enhanced programs include Apple Writer III for word processing, VisiCalc III and Business Graphics III for preparing and analyzing detailed business information, Business BASIC and Pascal III for developing advanced application programs, and Script III for formatting Pascal text into layout-perfect printouts. In addition, an updated version of Mail List Manager will soon be available for maintaining mailing lists and printing labels using an Apple III/ProFile system.

Expansion

Apple III can be expanded to up to 256 kbytes of internal memory using the latest 64 kbyte random-access memory (RAM) technology. This provides more information storage with lower power consumption, resulting in enhanced reliability. The additional memory also enables users to run larger, more sophisticated programs than previously possible.

The memory enhancement is also available as an upgrade kit to present owners of Apple IIIs with 128 kbytes of RAM memory. It will be offered as a system option early this year.

Each Apple III comes with a set of system-software diskettes which contain the Sophisticated Operating

System (SOS 1.1), the utilities file and device-maintenance formatting software and the emulation-mode software.

The software supports up to 256 kbytes of internal memory and uses no additional I/O slots, leaving four slots free for peripheral devices. It has a Disk Switch Detect feature that protects against writing data on an incorrect disk. This feature supports the RS-232-C protocol, a communication standard that allows immediate use of most serial printers via a built-in interface, and communicates with other devices using modems. The software also provides an enhanced emulation mode that allows almost all Apple II software to run on Apple III.

The ProFile Personal Mass-Storage System expands the usefulness of the Apple III in applications requiring large amounts of stored data, and accesses data faster than conventional floppy disk drives. ProFile is a complete, self-contained unit featuring an intelligent controller, a 5¼-inch Winchester drive, a power supply and an interface card.

Apple III owners can upgrade to the new version at no charge even if the warranty has expired. Registered owners of Apple IIIs will receive mailed notification of the upgrade process directly from Apple.

The new Apple III with 128 kbytes of memory and SOS software is priced at \$3495. The complete system with Business BASIC, VisiCalc, SOS and Monitor III is \$4190.

The minimum Apple III configuration needed to operate the ProFile mass-storage system includes 128 kbytes of RAM, the new SOS 1.1 operating system and utilities. The price of the Apple III/ProFile system is \$6994.

For more information: Apple Computer, 10260 Bandley Dr., Cupertino, CA 95014; (408) 996-1010.

CIRCLE 151

Anadex Printer Distributors

NORTHWEST (Oregon, Washington, W. Idaho)

Sigma Distributing
Bellevue, WA (206) 454-6307

NORTHERN CALIFORNIA

Basic Electronic Distributors
Santa Clara, CA (408) 727-1800

Terminal Rentals
San Jose, CA (408) 292-9915

Byte Industries
Hayward, CA (415) 783-8272

Computerland
San Leandro, CA (415) 895-9363

SOUTHERN CALIFORNIA

Basic Electronic Distributors
Inglewood, CA (213) 673-4300;
San Diego, CA (714) 268-8000

Terminal Rentals
Tustin, CA (714) 832-2414

SOUTHWEST

(Texas, Oklahoma, Arkansas, W. Louisiana)

Barnhill Associates, Inc.
Richardson, TX (214) 231-2573;
Houston, TX (713) 688-9971; Austin, TX (512) 451-0217

ROCKY MOUNTAIN STATES (Colorado, Wyoming, Montana, Utah, E. Idaho, Arizona, New Mexico)

Barnhill Associates, Inc.
Englewood, CO (303) 779-3600;
Scottsdale, AZ (602) 947-7841;
Albuquerque, NM (505) 299-7658;
Murray, UT (801) 262-3000

MIDWEST (Illinois, Missouri, Kansas, Nebraska, N. Dakota, S. Dakota, Minnesota, Indiana, W. Kentucky, Iowa, Wisconsin)

Tek-Aids, Inc.
Arlington Heights, IL (312) 870-7400

Comtel Corporation
Chicago, IL (312) 539-4838; St. Louis, MO (314) 428-5508;
Shawnee Mission, KS (913) 722-1030; Minneapolis, MN (612) 835-3060; Indianapolis, IN (317) 253-1681;
Cedar Rapids, IA (319) 377-9434;
Brookfield, WI (414) 786-1940

NORTHEAST (Connecticut, Vermont, Massachusetts, Maine, Rhode Island, New Hampshire)

Pat Jenks Associates
North Haven, CT (203) 239-6201;
Woburn, MA (617) 938-0488

Microamerica Distributors
Needham, MA (617) 449-4310

NEW YORK METROPOLITAN AREA

Logan, Inc.
Fort Lee, NJ (201) 224-6911 / (212) 594-8202

MID-ATLANTIC STATES (Maryland, Washington, DC, Virginia, W. Virginia, E. Pennsylvania, S. New Jersey)

Micro Distributors, Inc.
Rockville, MD (301) 468-6450
Plymouth Meeting, PA (215) 265-1600

SOUTHEAST STATES (Louisiana, Florida, Alabama, Mississippi, Georgia, N. Carolina, S. Carolina)

Currie, Peak & Frazier, Inc.
Huntsville, AL (205) 536-1506;
Orlando, FLA (305) 855-0843;
Greensboro, NC (919) 273-3040

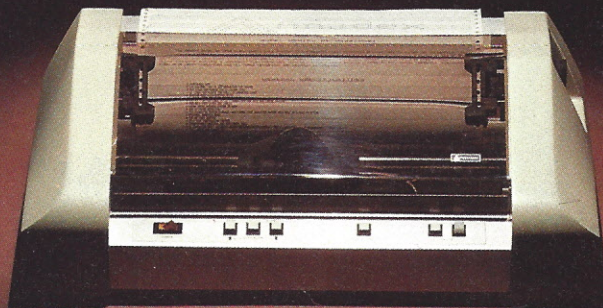
CANADA

Nelma Electronics Ltd.
Mississauga, Ont. (416) 624-0334

 **Anadex**
...the plus in printers

The important plus in matrix printers:

grafixPLUS.™



Since their introduction in mid-1980, the Anadex high-resolution DP-9500 Series matrix printers have set new standards for printer quality and performance. All models feature the rugged Anadex 9-wire print head that combines long life with resolutions of 72 dots/inch vertical and up to 75 dots/inch horizontal. With this kind of resolution, fineline graphics (under data source control) and razor sharp characters are pluses built into every printer.

Performance Plus

The full standard ASCII 96 character set, with descenders and underlining of all upper and lower case letters, is printed bi-directionally, with up to 5 crisp copies, at speeds up to 200 CPS. Models DP-9500 and DP-9501 offer 132/158/176 and 132/165/198/220 columns respectively. Print densities are switch- or data-source selectable from 10 to 16.7 characters/inch. All characters can be printed double-width under communications command.

Interface Plus

Standard in all models are the three ASCII compatible interfaces (Parallel, RS-232-C, and Current Loop). Also standard is a sophisticated communications interface to control Vertical Spacing, Form Length and Width, Skip-Over Perforation, Auto Line Feed, X-On/Off, and full point-to-point communications.

Features Plus

As standard, each model features forms width adjustment from 1.75 to 15.6 inches, shortest-distance sensing, full self-test, 700 character FIFO buffer (with an additional 2048 characters, optional), and a quick-change, 6 million character life ribbon.

Quality Plus

Beyond the built-in performance of the grafixPLUS series printers, the engineered-in quality and support are equally important. The result? Approval of both UL and FCC, Class A; operating noise levels under 65dbA; and a nationwide service organization second to none.

To see for yourself why the grafixPLUS printers offer more pluses for your printing dollar, contact us today.

 **Anadex**
the plus in printers

Made in
U.S.A.
for the World

ANADEx, INC. • 9825 DeSoto Avenue • Chatsworth, California 91311, U.S.A. • Telephone: (213) 998-8010 • TWX 910-494-2761
U.S. SALES OFFICES, San Jose, CA (408) 247-3933 • Irvine, CA (714) 557-0457 • Wakefield, MA (617) 245-9160 • Austin, TX (512) 327-5250
ANADEx, LTD. • Weaver House, Station Road • Hook, Basingstoke, Hants RG27 9JY, England • Tel: Hook (025672) 3401 • Telex: 858762 ANADEx G

Stop the Floppy Shuffle



Announcing The David Hard Disk Subsystem

Compared to cassettes, floppies were the greatest thing since integrated chip. But with increased applications, data bases, and speed requirements, a lot of business people are spending more time doing the "Floppy Shuffle" and less time doing work.



Now with Konan's David Hard Disk Subsystem you can have 32 times the storage of a mini-floppy in about the same amount of space. At a cost per megabyte that really makes sense, the David Subsystem is available for a variety of micro-computers.

So if you own a personal computer, check into the David Hard Disk Subsystem at

your local dealer and stop doing the Floppy Shuffle. And if you want real timesharing capabilities, a networking card is available.

The David Subsystem is available immediately.

Toll-free Information Line

800-528-4563

KONAN
KONAN
KONAN™

KONAN CORPORATION
1448 NORTH 27TH AVE, PHOENIX, AZ 85009
(602) 269-2649, TWX/TELEX 9109511552

HARDWARE

SYSTEMS

Desktop Computer

The MPT/100 technical desktop computer is available for engineering and scientific applications. With the MP/OS operating system, the system can be used for program development in FORTRAN IV, BASIC, Pascal and assembly language.



The system has 64k of local memory, 716k of minidiskette storage, a 12-inch green-phosphor video screen, an 83-key keyboard and two 5¼-inch floppy disk drives. For communications, the system also has two RS-232-C programmable synchronous/asynchronous ports.

Applications include engineering and scientific computations, laboratory automation, medical diagnostics, data acquisition and process control, numerical control and remote data-entry.

The price is \$5350.

For more information: Data General, Rt. 9, Westboro, MA 01581; (617) 366-8911. **CIRCLE 152**

Technical Systems

Two technical computer systems are available for industrial and scientific applications. The computers can be used for automating laboratory experiments, procedures and data processing.

One of the systems is the 3100, which includes a Vector 3 Z80-based processor and terminal, and two 5¼-inch double-sided floppy disk drives

Free Heathkit Catalog

**featuring computers,
peripherals and software
for home and business.**

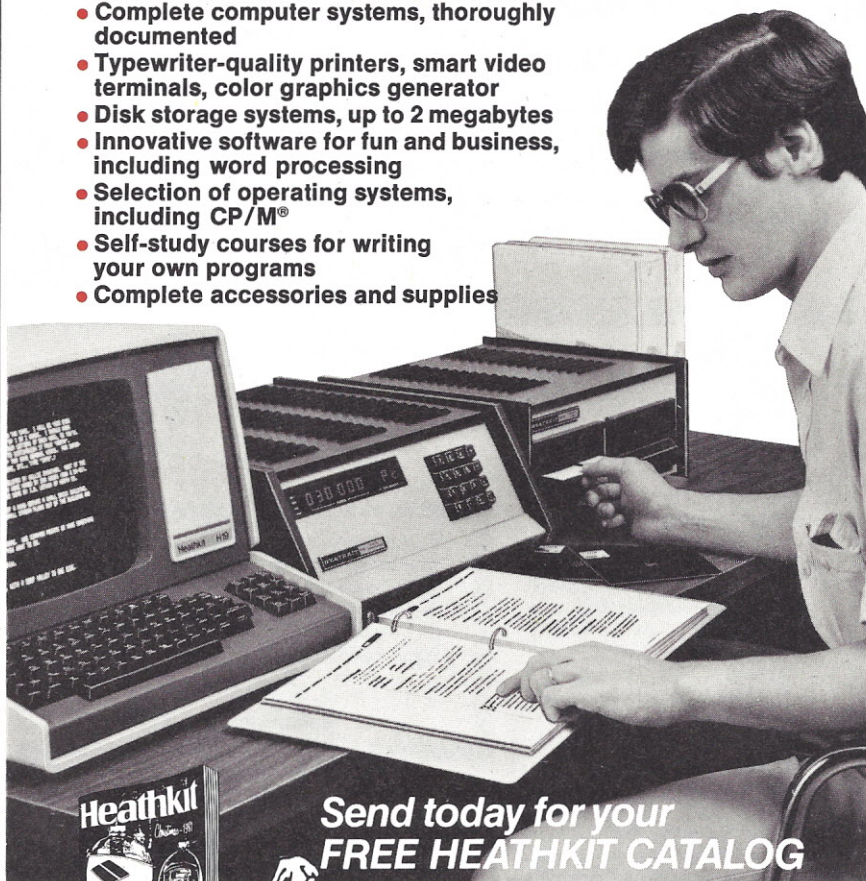
Build it yourself and save — up to 30% over comparable assembled units.

Build it yourself and learn — know your system from the inside out, know how to make it grow as your skills grow, change as your needs change.

Build it yourself the easy Heathkit way — with step-by-step assembly manuals, friendly over-the-phone assistance and 56 service locations nationwide.

Your Heathkit Catalog offers you:

- Complete computer systems, thoroughly documented
- Typewriter-quality printers, smart video terminals, color graphics generator
- Disk storage systems, up to 2 megabytes
- Innovative software for fun and business, including word processing
- Selection of operating systems, including CP/M®
- Self-study courses for writing your own programs
- Complete accessories and supplies



**Send today for your
FREE HEATHKIT CATALOG**



If coupon is missing, write Heath Co., Dept. 352-852, Benton Harbor, MI 49022
In Canada, write Heath Co., 1480 Dundas Highway East, Mississauga, Ontario L4X 2R7

Please send my free Heathkit Catalog. I am not currently receiving one.

Send to: Heath Co., Dept. 352-852,
Benton Harbor, MI 49022

Name _____

Address _____

City _____ State _____

CP-197 _____ Zip _____

CIRCLE 55

January 1982/Personal Computing

123

for 1.2 Mbytes of storage. The system also has an 18-board card cage for a variety of S-100 bus interface cards.

The second system is the 3105, which has the same terminal and card cage as the 3100, but has a 5-inch Winchester disk with 5 Mbytes of storage backed by a single 630k floppy disk.

Adding interface boards to the systems will enable users to perform pilot process control, non-destructive and other testing, biophysics, medical electronics, food technology, and a wide range of electronics, physics, optical and electromechanical experiments.

The 3100 costs \$5795 for the central processor and terminal, 1.2 Mbyte floppy disk drives and 18-slot card cage. The 3105 costs \$8495 for the central processor and terminal.

18-slot card cage, 5 Mbyte 5-inch Winchester drive and floppy disk backup.

For more information: Vector
Graphic, 500 N. Ventu Park Rd.,
Thousand Oaks, CA 91320; (805)
499-5831. **CIRCLE 153**

CIRCLE 153

PERIPHERALS

Dot-Matrix Printer

The PC-8023A is a high-speed dot-matrix printer with standard parallel interface. It can bidirectionally print the PC-8001A's set of upper- and lowercase ASCII and numerous Greek, mathematical and graphic symbols.

Using either cartridge or ribbon spools, it prints dot-graphic screens

on paper. The printer can use either pin or friction-feed delivery, and allows up to three copies of fanfold, roll or cut-sheet paper and originals. Paper widths are 4½ to 10 inches overall, and 3½ to 9 inches center to center.



Matrix options include 7×9 English, 8×8 graphic and 8×8 dot graphic. Font sizes range from 136 column, 17 characters per inch to 49 column, 4 characters per inch in en-

EDAS 3.5

EDAS is a sophisticated Editor and Assembler for TRS-80 I & III

- All text may be input in upper or lower case.

- All text may be input in upper or lower case.
- Assemble directly from one or more disk files via *GET.
- Assemble to disk or memory
- Binary, octal, decimal, hex, and string constants; Multiple constants may be input on a single line.
- CMDFILE utility included.
- Conditional assembly support.
- Cross-Reference utility.
- DOS functions DIR, FREE, KILL, and LIST are supported.
- 14-character labels including special chars. "@", "\$", "!", "?".
- Editor includes block move, global change, renumber, find.
- EDTASM & M-80 source files can be read or written.
- Expression evaluator supports +, -, *, /, MOD plus logical AND, OR, and XOR.
- Paged & titled listings with page numbers and date/time.
- PAGE, TITLE, SUBTTL, SPACE, & COM pseudo-ops supported.
- Set memory size, page prompt, JCL execution, Abort option.
- EDAS is supported with TRSDOS compatible DOSs (LDOS, VTOS).
- Price is \$79.00 + \$4.00. S&H.



MISOSYS MISOSYS MISOSYS MISOSYS MISOSYS

LDOS, Version 5.1 is the Ultimate in Operating Systems for the TRS-80 Models I and III. MISOSYS is your East Coast Headquarters for LDOS, the documented system! Version 5.1 is priced at \$169.00 + \$5.00 S&H per system. Deduct \$50 if ordering both.

LOGS 5.1

DSMBLA

Complement your assembly language tools with this Z-80 disassembler which produces screen, printer, cassette, or disk file output. A two pass process provides SYMBOLS for 16-bit address and 8-bit relative references. EQUates & ORG are generated. Read SYSTEM programs & display load address range. \$20 (DSMBLR I for non-disk use is \$15).

EDAS, CMDFILE, DSMBLR Specify Mod I or III. Add \$1 S&H+\$\$.50 per program. VA residents add 4%.



MISOSYS - Dept. P3
5904 Edgehill Drive,
Alexandria, Virginia 22303
703-960-2998 MicroNET 70140,310
Dealers Inquiry Invited



DISKMOD

Turn your Editor Assembler into a disk package. This 32K patch modifies EDTASM for DOS operation. Features? Add full disk I/O, block move, global change, printer pagination, sorted symbol table, print memory utilization, enhance DEFM expansion, protect memory, and recover after BOOT. From within the EDTASM you will have DIR, KILL, & FREE. Upgrade your EDTASM! \$20.

THE BOOKS

THE BOOKS must be a part of your tools. Volume I gives you access to all math operations in your Level II ROM. A symbol table of the entire machine noting over 500 addresses is included. Volume II tells you everything you wanted to know about the level II I/O—printer, keyboard, video, and cassette routines are fully explained. Each volume has a fully commented listing of all the routines discussed. **THE BOOKS** will save you hours of assembler programming. Each volume is priced at \$14.95 or buy both for \$24.95. Add \$1.50 S&H per book.

Solve the Great Software Mystery!

You spent a lot of time searching and researching to find just the right computer. But when it comes to compatible software, you're stymied. Where do you turn? What is the key that unlocks the software mystery? The answer is elementary. It takes a company with the expertise and research facilities to discover and develop a wide variety of quality software programs — a company with a staff of experts who understand both software and hardware — a company that is not only reliable but offers unique 24-hour services and — a company dedicated to being your software company.

With all these pluses there's no mystery as to why Westico is so popular with knowledgeable software buyers. But look! There's more.

The Westico 24-Hour Computer Hotline (203) 853-0816

(300 baud) for detailed program information and quick access ordering.

- A full range of professional software.

- Support for a wide variety of CP/M® and other computer systems, including: TRS-80 Model II, Apple, Vector Graphic, Cromemco, North Star, Micropolis, Ohio Scientific, Altos, Dynabyte, IBM, SuperBrain, Xerox, Zenith and more.

Two new solutions from Westico

LEGAL BILLING & TIMEKEEPING

The LBS is designed for law offices with up to 25 attorneys and 35 timekeepers, including paralegals and secretaries. The system distributes all Time and Expenses to client accounts or designated Overhead Accounts, and produces monthly Client Review sheets. After any adjustments it also provides: ready-to-mail itemized bills, monthly Office Management Summary, Aged Receivables Report. An Accounts List is also built into the system.

Complex transactions recording is reduced to a minimum because the LBS system is based on daily timesheets prepared by each timekeeper with a complete system for coding client matters and expenses. The attorney auditing the pre-billing review form can choose various predetermined rates, or bill on retainer, contingency fee or an adjusted basis.

The Office Management Summary provides a financial analysis of each attorney's billings, aging of his accounts receivable and an analysis of the work effort of each timekeeper and total

for the firm. The Accounts List summarizes current activity and status of each client.

The LBS is designed so that even first-time computer operators can install the system without expert help.

System/documentation-\$895
Demonstration System-\$ 75
Documentation alone-\$ 40

MICRO-TAX

Micro-Tax provides in-house computerized tax capability for the tax practitioner or serious investor. The system is designed to accept information, summarize data, compute tax and print the returns required by the Internal Revenue Service. The system's immediate response capability gives both tax specialist and clients immediate results of the computation.

The system reduces time required to complete a return while also minimizing the tax obligation of the taxpayer within the limit of the law. Three levels of tax preparation systems are available:

Level 1 —

Uses 23 schedules and forms, handles multiple clients, and prints IRS approved forms.

Level 2 — All of

Level 1 plus six more schedules and forms, depreciation system, state tax interface, integrated data base for year to year data storage, and batch compute and print functions.

Level 3 — All of Level 1 plus partnership schedules and forms.

State tax computation

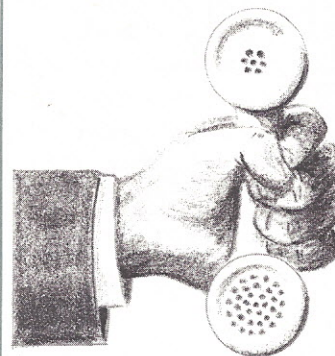
for the following states is available at additional cost: Arizona, California, Illinois, Ohio, Oregon, Maryland, New York,

Utah, Virginia and Washington, D.C.

Other states and municipalities are being added.

Prices:

Level 1 — \$250
Level 2 — \$1,000
Level 3 — \$750
Level 2 plus Level 3 — \$1,500
State Tax — Call for prices
Demonstration system — \$75



4 WAYS TO ORDER

- Write Westico, Inc., 25 Van Zant Street, Norwalk, CT 06855.
- Call (203) 853-6880.
- Telex 643-788.
- Dial-up our 24-hour computer (300 baud) (203) 853-0816.

COD, MasterCard and VISA accepted.

Prices do not include shipping and are subject to change. In CT add 7½% sales tax. All sales final.

Manual price may be credited toward purchase of software.

Dealer inquiries invited.

Copyright © 1981 Westico, Inc.
WES-40

Send for **FREE** catalog

WESTICO

The Software Express Service

25 Van Zant Street • Norwalk, Connecticut 06855
(203) 853-6880 • Telex 643-788

HARDWARE UPDATE

hanced pica. All fonts feature fixed- or proportional-spacing format options at six or eight lines per inch plus 1/144-inch incremental line feed.

The price is \$795.

For more information: NEC Home Electronics, Personal Computer Div., 1401 Estes Ave., Elk Grove Village, IL 60007; (312) 228-5900.

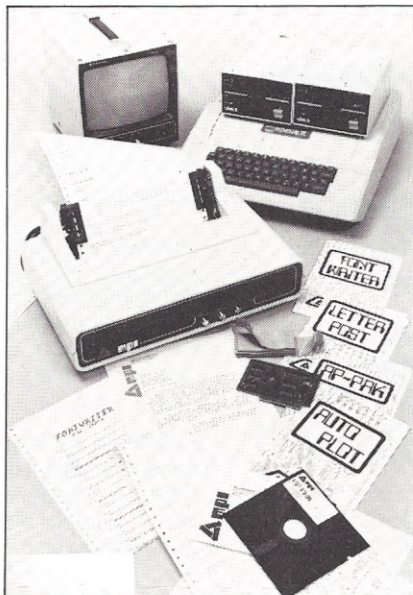
CIRCLE 154

Application Package

The AP PAK is an application package consisting of hardware and software products. The package contains an AUTO PLOT printer-control card, an interface cable, software programs and instruction manuals for the Apple II.

The AUTO PLOT card plugs into the Apple II peripheral slots and

drives a graphics printer through a parallel I/O cable supplied with the package. The card can transmit a



graphic picture from any Apple high-resolution display to the printer with a single keystroke. If suitable control parameters are supplied, it can print the display in any of three heights or 12 widths, indented, rotated 90 degrees or it can print separate graphic files side by side.

FONT WRITER is one of the software programs provided with the AP PAK. The user can select a printout in three different graphic fonts in three heights and six widths.

LETTER POST is another software program provided with the package. It facilitates the computer generation of individually printed letters to specified names from a mailing list. Prewritten paragraphs can be chained to make a letter and can be printed out in any font or type style available with FONT WRITER.

TRS-80™ DISCOUNT - BUY DIRECT

WE SELL THE FULL LINE OF TRS-80'S AT WHOLESALE PRICES

MODEL II

26-4002 64K I Drive..... \$3288
Ask About Hard Drives

MODEL III

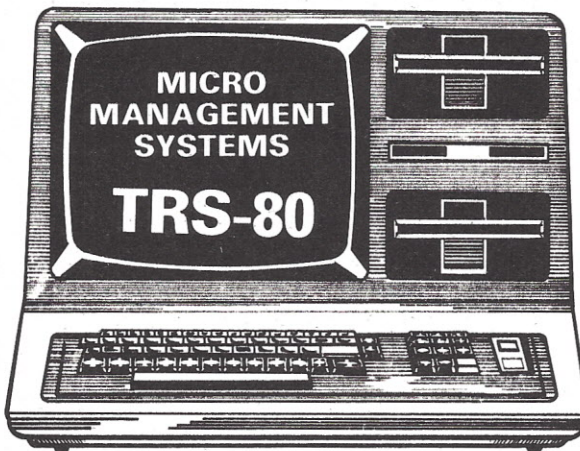
26-1062 16K..... \$849
26-1066 48K with
2 Drives, RS232..... \$2069

COLOR COMPUTER

26-3001 4K..... \$318
26-3002 16K Ext. Basic..... \$488
26-3003 32K Ext. Basic..... \$578

POCKET COMPUTER

26-3501 Pocket Computer.... \$188



**CENTRONICS
739-1 PRINTER**

\$699⁰⁰

**THOUSANDS OF
SATISFIED
CUSTOMERS**

WRITE FOR YOUR
FREE CATALOG

**ORDER TOLL FREE
1-800-841-0860**

•LARGE INVENTORY
•FAST DELIVERY

TM - TANDY CORPORATION
FREE COPY OF WARRANTY UPON REQUEST

**MICRO
MANAGEMENT
SYSTEMS, INC.**

DEPT. NO. 9
115C SECOND AVE. S.W.
CAIRO, GA. 31728
GA. 912-377-7120

CIRCLE 58



**Don't make your
computer old
before its time**

Now there's Palantir™ — Word Processing and Accounting Software for Today's Computers

You've just gotten a brand new computer. Don't tie it down with old software. Two-year-old software will make it run like a two-year-old computer.

The microcomputer industry is the fastest growing, most exciting industry in the world. Today's printers, terminals and disk drives can do things no one even dreamed of two years ago.

But a computer is just a dumb piece of metal until software gives it life, and, unfortunately, microcomputer software has not kept up with the hardware.

Until now.

There's a commonly held belief that you should not buy new software because it hasn't been tested. We say, "Hogwash!"

At one time those complaints might have been valid, but the software industry has come of age. We do our testing *before* we release a product, not afterwards.

More importantly, we've learned that quality cannot be

tested into a product; it must be *built* in from the beginning by people who know what they are doing.

And we do.

We formed Designer Software because we believed that the quality hardware of today demanded software of equal quality. It took a lot of time, sweat, money, care, experience and talent to make that belief a reality.

We set high standards, but our team of CPA's, systems analysts, programmers, writers, artists and marketers that created *Palantir*™ Word Processing and Accounting have exceeded all of our expectations.

Palantir™ is the most professional packaged software ever to be offered to the CP/M® market.

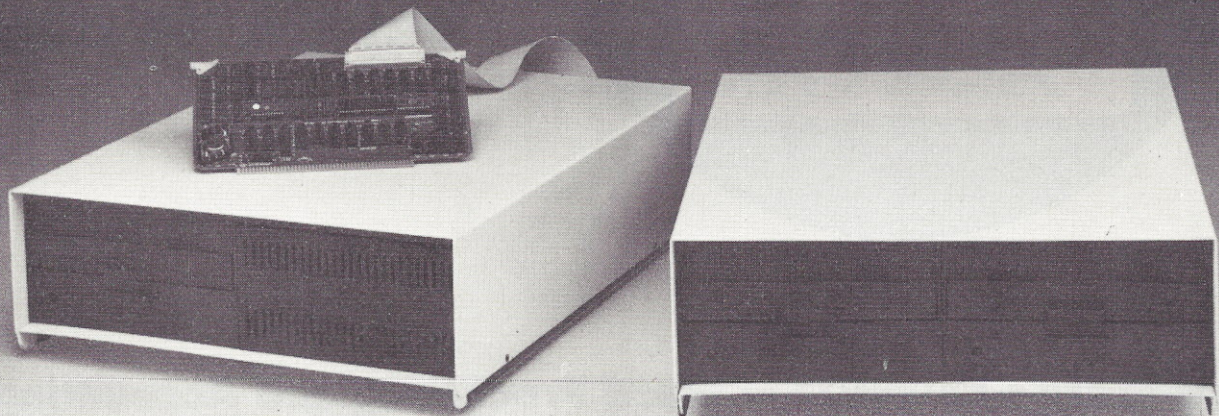
We don't expect to convince you of that with just one ad, and we won't try. But if you're in the market for business software, we hope we've convinced you to find out more about *Palantir*™ — today's software for today's computers.



For more information and the name of a dealer near you, please write, call, telex or use The Source. Dealer, distributor and OEM inquiries invited.

**3400 Montrose Blvd. • Suite 718 • Houston, Texas 77006
(713) 520-8221 • Telex 790510 • Source TCU671**

WE'LL "DRIVE" YOU WILD



with our variety of quality disk drives.

ASAP carries only the highest quality floppy disk drives, to provide you with years of trouble-free service and superior performance.

Data Trak™ double-sided double-density drives from Qume® feature state-of-the-art technology. You get superior data integrity through improved disk life, data reliability and drive serviceability.

Data Trak™ 5 (ANSI 5¼" compatibility) Call for price
Data Trak™ 8 (IBM compatibility) Call for price

Shugart drives have been setting industry quality and reliability standards for years. Shugart's Bi-Compliant™ head assembly provides superior media compliance and high reliability.

Model 801 (standard floppy) \$425.00
Model 850 \$640.00
Dual Disk Drive Cabinet \$225.00

ASAP offers a full line of high reliability disk drive subsystems.

HDC8/1-HD — Cabinet with (1) Priam 10 megabyte hard disk drive with Microbyte Controller Call for price

HDC8/1F+1HD — Cabinet with (1) Qume® DT-8 double-sided, double-density drive, and (1) Priam 10 megabyte hard disk drive with Microbyte Controller Call for price

CAB8H — Dual cabinet for 8" floppy disk drives (horizontal mounting) \$ 225.00

CAB8V — Cabinet for 8" floppy disk drives (vertical mounting) \$ 225.00

CAB8H/V+1S — Dual cabinet with (1) Shugart SA801R installed (horizontal or vertical mounting) \$ 750.00

CAB8H/V+2S — Dual cabinet with (2) Shugart SA801R's installed (horizontal or vertical mounting) \$1150.00

CAB8H/V+1Q — Dual cabinet with (1) Qume® DT-8 double-sided double-density drive installed (horizontal or vertical mounting) \$ 830.00

CAB8H/V+2Q — Dual cabinet with (2) Qume® DT-8's double-sided double-density drive installed (horizontal or vertical mounting) \$1350.00

CAB8V/2F-9SMB — Desk top cabinet for (2) 8" Shugart or Qume® floppy disk drives, 9-slot motherboard, card cage, fan, dust filter, power supply, all power and drive cables \$ 425.00

*All cabinets come complete with power supply, fan and internal cables.

asap
 computer
 products, inc.

1198 E. Willow St., Signal Hill, CA 90806

Toll free outside California:
(800) 421-7701

Inside California:
(213) 595-6431
(714) 891-2663

For superior quality, high reliability disk drives, contact ASAP today.

ASAP offers a 120-day buyer protection policy: full money-back guarantee if not totally satisfied.

Ordering information: name, address, phone; ship by: UPS or truck. Please call for shipping charges.

Terms: We accept cash, check, money orders, Visa and Master Charge (U.S. funds only). Tax: 6% Calif. res. COD's and terms available on approval (school PO's accepted).

HARDWARE UPDATE

Graphic pictures can also be inserted in the text.

The price of the package is \$145.

For more information: MPI, 4426 S. Century Dr., Salt Lake City, UT 84107; (801) 263-3081. **CIRCLE 155**

Printer Driver

An RS-232 Printer Driver is available for the TRS-80 Model I, Level II with 16k. It is equipped with an RS-232-C board, is coded in assembly language and interfaces with the LLIST and LPRINT commands.

The driver has 16 user-selectable options that allow it to interface to almost any type of serial printer. Options include form length, pagination, carriage width, null after C/R insertion, hardware handshake and X-ON/X-OFF recognition.

The price is \$35 including a cassette and manual.

For more information: Micro Systems Software, 3235 Kifer Rd., Suite 32, Santa Clara, CA 95051; (408) 735-1650. **CIRCLE 156**

COMMUNICATION

Integrated Modem

The Apple-Cat II is a large-scale integrated modem for the Apple II and II Plus. It has eight selectable transmission rates up to 1200 baud on a single printed-circuit board.

Features of the modem include software on a floppy diskette and a selectable menu of 19 functions displayed on the CRT screen. Each function can be activated by pressing a single key on the keyboard. Programming knowledge is not required as all operations are identified on the

screen. It also offers a 45.5 baud Baudot-coded Weitbracht modem for deaf and hearing-impaired users.

The modem can operate at 50 or 75 baud for very low-speed communication; 110 or 150 baud which is normally used for teletypewriters; and 300, 600 or 1200 baud for use on standard dial-up telephone lines.

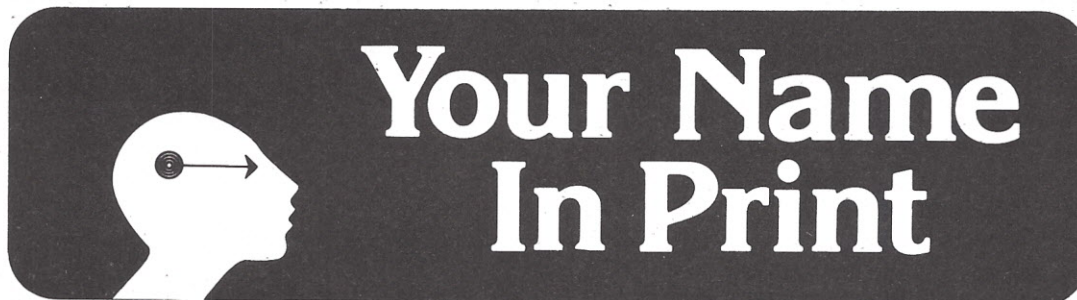
The price is \$389.

For more information: Novation, 18664 Oxnard St., Tarzana, CA 91356; (213) 996-5060. **CIRCLE 157**

TRS-80 Multiplexer

A new communications multiplexer allows the TRS-80 Model II to respond to information requests from as many as 16 telephone lines at once.

When used with a TRS-80 Videotex terminal or Radio Shack Videotex software, the multiplexer makes private-information networks possi-



It can be. If you become an author for Personal Computing. But can you do the kind of writing we're looking for? Find out. Call or write and ask for a copy of the authors' guide.

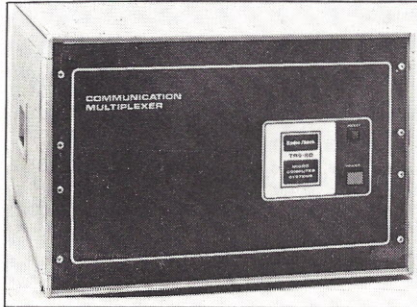


**PERSONAL
COMPUTING**
AUTHORS' GUIDE

50 Essex Street
Rochelle Park, NJ 07662
(201) 843-0550

HARDWARE UPDATE

ble for such special-interest user groups as farmers, publishers, newspapers, professional organizations and large individual corporations.



In an operating Videotex system, a calling terminal first sees a listing (or menu) of the categories of information which can be retrieved from the memory of the Model II host computer. Once the caller has specified a selection, the information is transferred from the Model II, over the

telephone line, and appears on the caller's terminal TV screen.

The multiplexer is available in two versions: with an eight-line capability for \$6000, or with a 16-line capability for \$8000.

For more information: Radio Shack, 1600 One Tandy Center, Fort Worth, TX 76102; (817) 390-3272.

CIRCLE 158

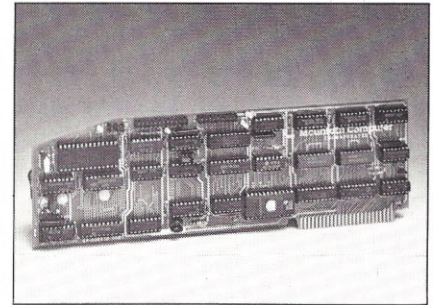
BOARDS

All-In-One Card

The CPS MultiFunction Card provides the capabilities of a serial interface, a parallel-output interface and a real-time calendar/clock. It occupies only one slot on the Apple II.

CPS is configured from a setup program on diskette which sets the

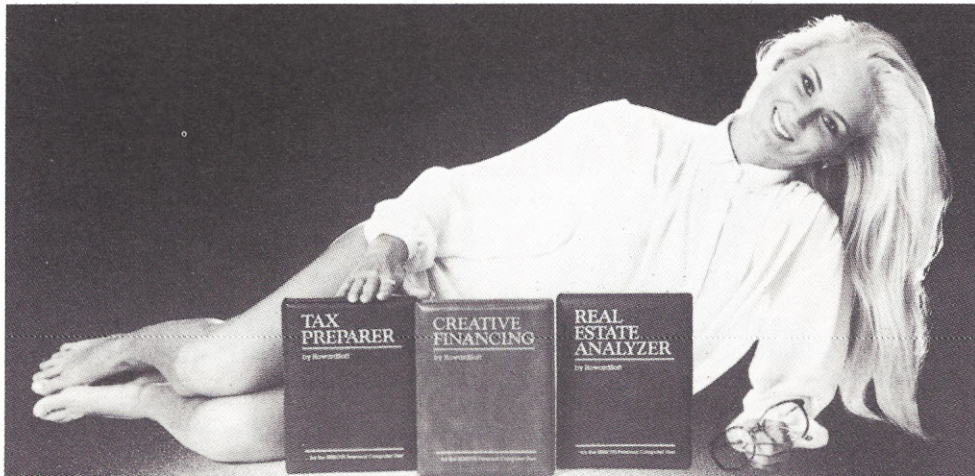
parameters for all functions contained on the card. Parameters are stored in CMOS RAM on the card and may be changed from the keyboard with control commands.



All function setups stored on-board are battery powered. The price is \$239.

For more information: Mountain Computer, 300 El Pueblo Rd., Scotts Valley, CA 95066; (408) 438-6650.

CIRCLE 159



THE BUSINESSMAN'S CHOICE

TAX PREPARER by HowardSoft:

A package for year-long record-keeping and year-end tax filing; prepares returns for several forms & all schedules using on-screen facsimiles; prints in IRS format for filing; buy now and purchase low-cost updates at year end.

CREATIVE FINANCING by HowardSoft:

A flexible package for evaluating real-life loans & investments; provides cash flow & R-O-I projections as well as payment tables and objective decisions; can be used to determine yield to maturity of discounted bonds, present value of annuities stream, buy vs. lease decisions, APR of loans including wraparounds and analyses of all new loan types.

REAL ESTATE ANALYZER by HowardSoft:

A tool for objectively comparing alternative investments and projecting future results; professional in both analyses of cash flow & R-O-I and client-oriented report printouts; allows what-if studies for changes in property values, loans, rents, taxes, operating expenses and the value of money; perfect for cash and profit projections on new or old rental property.

NOW AT YOUR LOCAL DEALER



Howard Software Services

...for the SERIOUS Personal Computer User

6713 Vista del Mar | La Jolla, CA 92037 | (714) 454-5079

CIRCLE 57

BUSINESS

Material Data Base

Bill of Materials has been added to the GOLD (General On-Line Database) software line. The program is designed to provide a multilevel parts explosion with unlimited levels for manufacturers.

Functions of the program include enter, lookup or change bill-of-materials, print bill-of-materials explosion and record production.

The program's summary report provides a "material requirements planning report" and gives information on quantity. This information includes required, on hand, on order, reserved and net-quantity required.

Bill of Materials is written in

CBASIC2, runs on most CP/M systems with hard or floppy disks and comes with source code. The price is approximately \$1500 including the GOLD inventory package.

For more information: Douthett Enterprises, 906 N. Main, Wichita, KS 67203; (316) 262-1040.

CIRCLE 160

Accounting System

Real-Tabs, written in North Star BASIC, is a computerized accounting package. It is available for real estate and management brokers, attorneys, title companies, mortgage brokers and other businesses.

The programs operate in a real-time mode making it possible to obtain various to-date reports (printed or viewed) at the end of each business day. Payroll is supported along with

summary reports of year-to-date or any specified time period. A database management system is also included, providing managerial control. Ordered files provide instant retrieval of the business history and identity of any client or customer.

The system is available for any North Star disk system or the North Star Horizon personal computer. The price is \$400. A demonstration disk and manual cost \$45; the manual alone costs \$15.

For more information: Vincent D. Puzar, 5905 Gulf Blvd., St. Pete Beach, FL 33706; (813) 360-7577.

CIRCLE 161

Financial Modeling

PLAN80 is a modeling system for personal computers. It interactively produces bar charts and line graphs

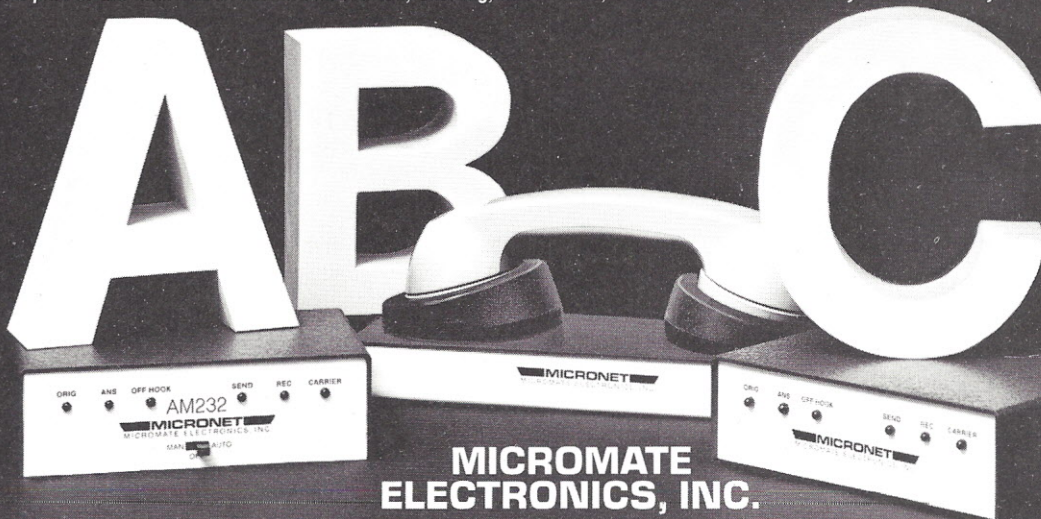
Select a modem for your computer...easy as ABC.

CHOOSE A. The Smart One™, Model AM232, with its own built in microcontroller. Auto Dials, Auto Answers, Auto Modes (originate/answer), "Direct Connect" for any computer with an RS232 interface ... \$299.00.

CHOOSE B. The Acoustic Modem, Model AMII/A, for the Apple*. Comes complete with a powerful operating system. Supports 25 easy to use keyboard commands and operates interactively with your programs. No interface card required! ... \$179.00.

CHOOSE C. The "Direct Connect" Modem, Model AMII, for the Apple*. Comes complete with a powerful operating system. Supports Auto Dial, Auto Answer, 27 easy to use keyboard commands and operates interactively with your programs. No interface card required! ... \$289.00.

Be a part of the information revolution. It's fun, exciting, informative, educational. Call or write your order today. COD's accepted.

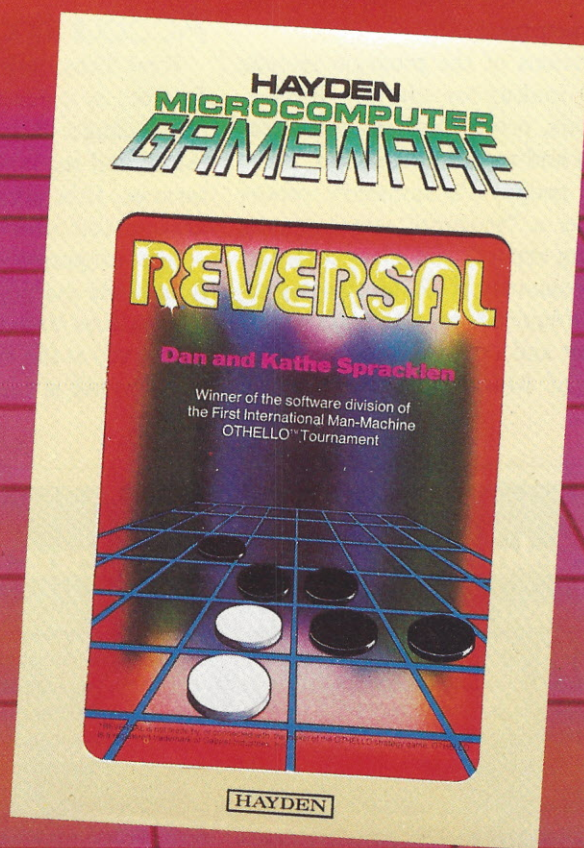
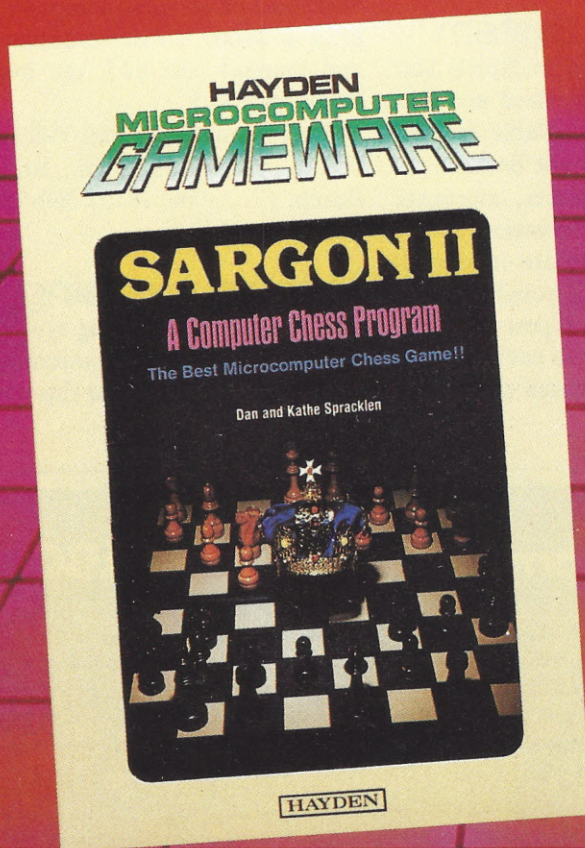


2094 Front Street • East Meadow, New York 11554 • Telephone 516.794.1072

All "Direct Connect" modems are FCC certified. *Registered trademark of Apple Computer, Inc.

Competition Classics!

By Dan and Kathe Spracklen



SARGON II

The great computer chess game!

REVERSAL

A challenging strategy duel!

Available at your local computer store

For Orders and Inquiries Call Toll Free

HAYDEN HOTLINE 800-631-0856

Hayden
Book Company, Inc.

50 Essex Street, Rochelle Park, NJ 07662

SOFTWARE UPDATE

on almost any CRT terminal to help users visualize planning results.

Users enter row and column definitions, data assumptions and calculation statements. Results are calculated and users have complete control over the format of reports. At any point assumptions may be changed interactively, and results may be recalculated and displayed or printed.

PLAN80 is available for Apple, CP/M and UCSD systems. The price is \$295.

For more information: Business Planning Systems, 2 North State St., Dover, DE 19901; (302) 674-5500.

CIRCLE 162

Word Processing

A color word-processing system with a self-teach program and a 12,000-word dictionary is now available.

The self-paced computerized "teach" program within the system assists those unfamiliar with computers and word processors. Another feature of the system is its ability to search and replace a word no matter how many times it appears in a document. Inserting and erasing is accomplished all in a single step. Also featured is a character-sensitive erase mode.

The system includes automatic page numbering; draft printing without leaving the document; and block move, copy, delete, write, print and justification capability. Easy integration of mail lists, an automatic disk-overflow routine, a diskette-supply indicator and single-key commands are also included.

The system is completely menu-driven so users always receive step-by-step instructions to reduce the possibility of error. A separate six-volume "Creative Programming" series is offered as an option for the first-time user wishing to learn more about other computer operations.

The price of the system is \$495. The first volume in the series is

\$12.95, and all other volumes are \$9.95 each.

For more information: NEC Home Electronics, Personal Computer Div., 1401 Estes Ave., Elk Grove Village, IL 60007; (312) 228-5900.

CIRCLE 163

EDUCATIONAL

Authoring System

The Blocks II Author Language System is a computer-assisted instruction program designed for edu-

The powerful package:

Super-Text II™

Allows you to learn the basics of text editing quickly. Advanced features will meet your expanding word processing requirements far into the future. \$150.00

plus Form Letter™

Provides automatic repetitive printing of letters. Allows insertion anywhere in a letter, also direct entry, optional prompting, special commands. \$100.00

plus Address Book™

Stores names, addresses, and telephone numbers and prints mailing labels. Has user-definable category system. \$49.95

**From the leader in word processing
for the Apple II or II Plus**

MUSE SOFTWARE™

Apple II is a trademark of Apple Computer Corp.

330 N. CHARLES STREET
BALTIMORE, MD 21201
(301) 659-7212

Call or write for information and
the name of your nearest MUSE dealer

CIRCLE 38

SOFTWARE UPDATE

cators who have little or no programming experience. The authoring system has been developed to help fill the gap between available and desired educational programs.

The system consists of several programs. A teacher-authoring program, used only when writing a lesson, allows the teacher to make use of the graphics library and combine graphic images with text for presentation to the student. The teacher also inputs the correct and incorrect answers and feedback appropriate to each response.

A student-presentation program presents the lesson to the student and allows him to interact with the previously authored program. It asks questions and gives feedback for each response.

The graphics-development program develops graphic images for the

graphics library. It enables the author to create new images, use portions of old images or combine images. It can fill an irregular shape with color and gives the author many colors and patterns from which to choose.

The graphics-library program is used when authoring a program. The teacher requests images from the graphics library and puts them into the lesson that is being written.

To keep track of student progress, the data-management program enables the teacher to set up a sequence of lessons that match the individual needs of each student.

Blocks II is available for use on a 3.3 DOS Apple. In student mode, the system requires an Apple II with a single disk drive.

The price is \$500.

For more information: San Juan

Unified School District, 3738 Walnut Ave., Carmichael, CA 95608; (916) 484-2011.

CIRCLE 164

Learning Lab

The TRS-80 Color Computer Learning Lab is a self-instruction system that teaches users how to program in Color BASIC.

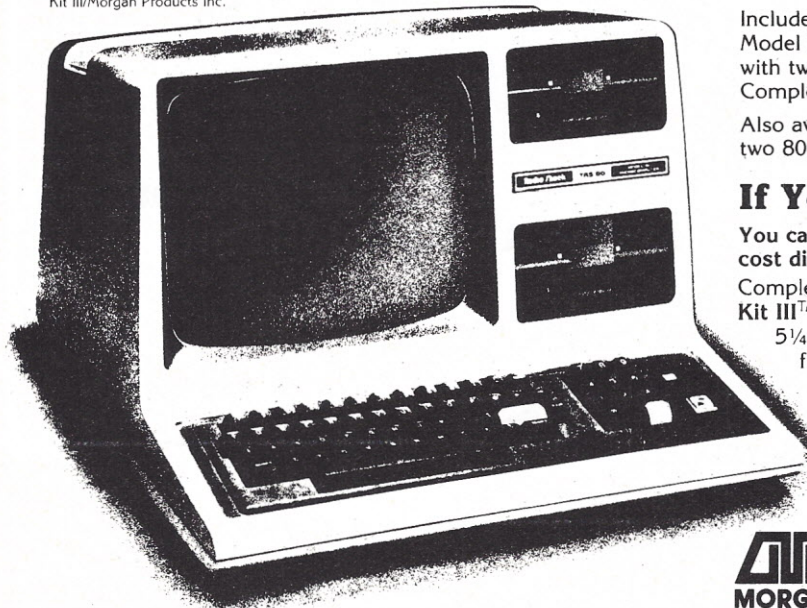
The lab is divided into three sections. The first section includes an introduction to the computer, shows how to enter programs and tells how the computer uses special words to describe each step. Twelve self-grading lessons are included.

The second section shows how the computer can be programmed to create games, solve formulas, create and play music, create art and teach. The 10 lessons contain software examples and experiments.

The third section includes pro-

SAVE \$600.⁰⁰ On TRS-80[®] 48K Model III

TRADEMARKS:
TRS-80 and TRSDOS/Radio Shack/Tandy Corp.
LDOS/Logical Systems Inc.
Kit III/Morgan Products Inc.



**Limited Supply Now Available
For The Low-Low Price Of \$1895.⁰⁰**

Includes all the standard basic features of the TRS-80[®] Model III with 48K of RAM and disk expansion Kit III[™] with two 40 track double density Tandem disk drives. Completely compatible with TRSDOS[™] and LDOS[™].

Also available — TRS-80[®] Model III same as above with two 80 track Tandem disk drives for only **\$2145.⁰⁰**

If You Own A 16K Model III.

You can easily expand your capabilities with our low cost disk expansion **Kit III[™]**.

Completely compatible with TRSDOS[™] and LDOS[™], the **Kit III[™]** single drive assembly includes: One 40 track 5 1/4" double density Tandem disk drive, power supply, floppy disk control card, mounting hardware, applicable cables and instructions. **ONLY \$599.⁰⁰**

Also available — Kit III[™] same as above with one 80 track Tandem disk drive for only **\$724.⁰⁰**

**Call TOLL FREE (800) 851-4614
In Illinois Call (618) 233-0018**

We accept: Visa, Master Charge, Certified Checks (Personal checks require three weeks clearance), Money Orders, and C.O.D.



Morgan Products Incorporated 104 Berkshire Drive Belleville, Illinois 62223

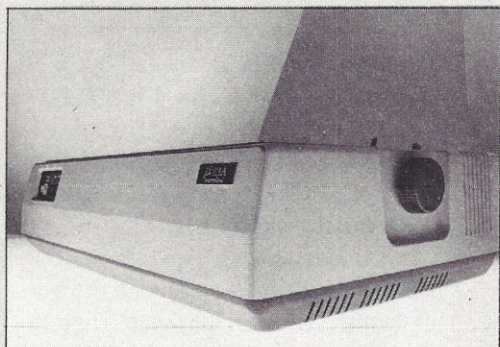
CIRCLE 61

OKIDATA

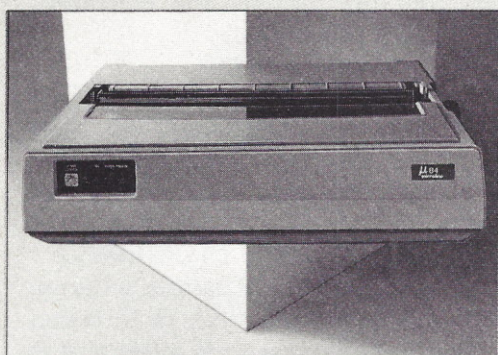
The Microlines:



ML-80: Prints unidirectionally at 80 cps. Business-quality printing and reliability at a price attractive even for personal use.



ML-83A: All the features of the 82A, including double-width and bold characters. The 136-column-wide carriage can handle paper up to 16 inches wide.

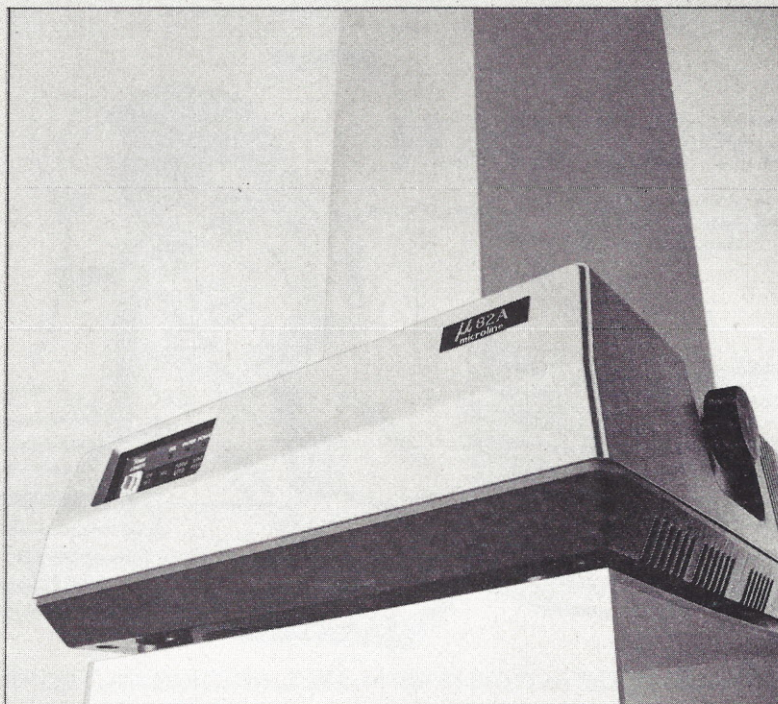


ML-84: Correspondence quality and data processing throughput. Prints bidirectionally at up to 200 cps, including charts, illustrations, forms, or dot-addressable graphics.

A remarkable family of printers for people who want more printer for their investment.

Stored-energy print head with a full year's guarantee. The full 96 ASCII character set. Block or dot-addressable graphics. A choice of print speeds, from 80 to 200 cps. In fact, all the full-featured performance of a big printer. At a small printer price. And the quality and reliability you have a right to demand.

Contact us at 111 Gaither Drive, Mt. Laurel, N.J. 08054 (609) 235-2600 for more information on the incomparable Microline family of fine printers. Also available through authorized Okidata distributors.



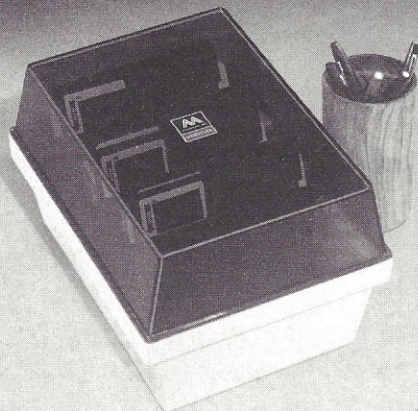
ML-82A: Prints 80 columns bidirectionally at 120 cps, has 9-pin head for true descenders. Short line seeking logic increases throughput by 80 percent.

Making small printers for people who think big

Okidata is a subsidiary of Oki Electric Industry Company, Ltd.

Introducing... **MINI-FLEX**^{T.M.}

Designed Specifically
to Protect 5" Diskettes



The Newest
Member of The
Advance Access
Diskette
Protection Family

For Further Information
CALL TOLL FREE
800 323-3412



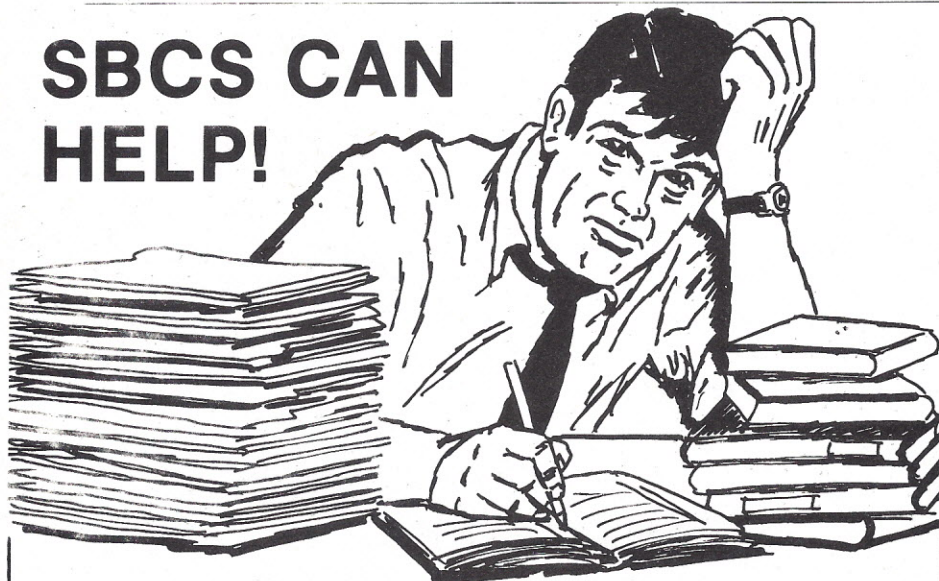
ADVANCE ACCESS

2200 South Main Street □ Lombard, IL 60148 □ 312 629-5800

"Manufacturers of Information Processing Supplies"

CIRCLE 63

SBCS CAN HELP!



ORGANIZE YOUR RECORDS WITH SBCS ACCOUNTING SOFTWARE!

Let our years of experience as a business software vendor for the Apple II work for you! Our highly recommended software combines flexibility, efficiency, and performance.

Our fully integrated programs include General Ledger and Accounts Receivable. Accounts Payable will be released soon.

CALL OR WRITE US TODAY!

All packages contain program, backup, and data disks, plus detailed documentation.

Some features are:

- extensive error checking and user prompting
- numerous report options
- user oriented documentation
- free updates and replacement of damaged disks
- Z-80 card NOT required

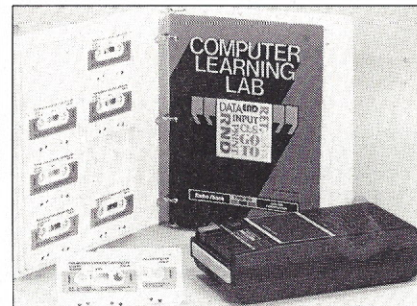
SMALL BUSINESS COMPUTER SYSTEMS

4140 Greenwood Ave., Lincoln, NE 68504 • (402) 467-1878

CIRCLE 64

SOFTWARE

programming guides and tools. Eight lessons illustrate these programming guidelines.



Included are eight program cassettes, for which a standard audio-cassette recorder is required, and a 30-lesson text. The price is \$49.95.

For more information: Radio Shack, 1800 One Tandy Center, Fort Worth, TX 76102; (817) 390-3300.

CIRCLE 165

UTILITY

Apple Editor

ADVANCED X-TENDED EDITOR (AXE), a programming aid, provides the user with a text-editor style extension to the standard Applesoft operating system.

AXE remains transparent to the user until called upon by one of over 30 commands. Features include global search/replace, character and statement insert/delete modes, auto line number, two packed editing modes, recall-editing modes, programmable-keyboard macros, four list formats and enhanced-cursor movement.

The price is \$69.95.

For more information: Versa Computing, 3541 Old Conejo Rd., Suite 104, Newbury Park, CA 91320; (805) 498-1956.

CIRCLE 168

Data-Base Processor

The Z65 is a data-base processor available for the Apple II. It consists of both hardware and software such as a Z80 cpu, a 6502-Z80 software interface and a Z80 implementation of MDBS.

MICRO

BUSINESS WORLD INC.
Information Line (213) 996-2252
TOLL FREE MAIL ORDER LINES
(800) 423-5886 Outside Calif

HEWLETT
PACKARD**HP 83****Special Of The Month**

LIMITED QUANTITIES

OUR PRICE

\$1399.00MSL
2250.00Save
951.00**HP DISC DRIVE
SINGLE MASTER
MODEL 82902M**

OUR PRICE

\$1099.00MSL
1500.00Save
401.00**COMPUTERS**

Apple Computer	List	Our Price
Apple II-16K	\$1330.00	\$999.00
Apple II-32K	1430.00	
Apple II-48K	1530.00	
Apple II-64K	1725.00	
Apple III 128-K	3915.00	2997.00
Apple II w/interface		
Dos. 3.3	645.00	499.00
Apple II Disk II Drive Only	525.00	429.00

**HEWLETT
PACKARD**

HP	List	Our Price
HP-125 Microcomputer	3750.00	2990.00
HP-85 Microcomputer	3250.00	2475.00
HP-83 Microcomputer	2250.00	1777.00
16K Exp-Memory Module	295.00	255.00
Graphics Plotter 7225	2450.00	2075.00
Personality Mod. For 7225	385.00	365.00
2631B Impact/Printer/		
Hvy Dty	3950.00	3250.00
Option 020 For 2631B	150.00	125.00
8 Drives to Choose		
from 829025	1300.00	1125.00
9895A 8" Dual Drive	6850.00	5500.00
Graphics Tablet 9111A	2050.00	1678.00
HP-11C Slim-Line Advanced	135.00	
HP-12C Slim-Line Financial	150.00	
HP-41 CV New 2.2		
Bytes Mem	325.00	250.00
HP-41C Calculator	250.00	185.00
Card Reader For 41CVC	215.00	162.00
Printer For 41CVC	385.00	289.00
Optical Wand For 41 CVC	125.00	97.00
Quad Ram Equals		
4 Mem. Mods	95.00	81.00
Memory Modules For 41C		25.00
HP-97 Programmable Printer	750.00	595.00
HP-67 Programmable		
Calculator	375.00	295.00
HP-34C Programmable		
Scientific	150.00	117.00
HP-38C Programmable		
Bus. R/E	150.00	117.00
HP-32E Adv. Scientific	55.00	48.00
HP-37E Business Mgmt.	75.00	57.00

Commodore	List	Our Price
8032-32K 80 Col Crt	1495.00	1097.00
4032-32K 40 Col Crt	1295.00	989.00
4016-16K 40 Col Crt	995.00	788.00
8050-Dual Disk 950K	1795.00	1344.00
4040-Dual Disk 343K	1295.00	989.00
C2N-Cassette Drive	95.00	77.00
4022-80 Col Printer	795.00	639.00
8024-Mannman Talley	1995.00	1545.00
25CPS-Stanwriter	1895.00	1399.00
CBM-IEEE Modem	279.00	225.00
Voice Synthesizer	395.00	325.00
VIC 20	299.00	255.00
PET to IEEE Cable	39.95	34.00
IEEE to IEEE Cable	49.95	39.00

XEROX	List	Our Price
Xerox 820-1 5-1/4" Disk	2995.00	2399.00
Xerox 820-2 8" Disk	3795.00	2995.00
CP/M Operating System	200.00	169.00
Word Processing Software	500.00	429.00
Super Calc	295.00	249.00

ATARI PERSONAL COMPUTERS	List	Our Price
400 16K Bytes of Ram	595.00	337.45
1080 16K Bytes of Ram	1080.00	739.00
410 Program Recorder	90.00	77.00
810 Disk Drive	600.00	457.00
825 Printer (80 col		
Centronic 737)	999.95	769.00
820 Printer (40 col		
impact)	450.00	353.00
830 Acoustic Modem	200.00	155.00
850 Interface Module	220.00	192.00
Atari Visicalc	200.00	164.00
Atari 400-16K	595.00	327.00

TEXAS INSTRUMENTS	List	Our Price
TI 99/4A Console New		
Improved	950.00	385.95
10" Color Monitor High		
Resolution	374.95	317.95
32K Memory Module	399.95	312.95
Speech Synthesizer	149.95	127.95
Disk Memory Drive	499.95	390.95
RF Modulator	49.95	42.50
Telephone Coupler (Modem)	224.95	185.95
Printer (Solid State)	399.95	315.95

ALTO'S 8CS 8000-15	5990.00	4450.00
SHARP-64K Z80 FULL KBD YX-3200	CALL	
NEC PC 8001	1295.00	1050.00

**APPLE II
STUDENT
SYSTEM**

- Apple II Plus System-48K RAM
- Disk II Floppy Disk & Interface (DOS 3.3)
- 12" Grn. Phs. Video Monitor

SAVE \$655 Our Price
\$1795
List \$2450.00

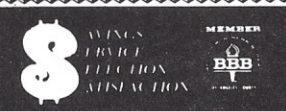
PRINTERS

EPSON	List	Our Price
MX 80 FT	\$ 745.00	\$ 549.00
MX 80 IMPACT	645.00	450.00
MX 70 IMPACT	500.00	390.00
MX 100	995.00	765.00
APPLE SILENTYPE		
ANADIX 9501	645.00	299.00
NEC	1650.00	1299.00
OKIDATA		
MICROLINE 80	545.00	395.00
MICROLINE 82	649.00	549.00
MICROLINE 83	1050.00	769.00
PAPER TIGER		
445G with Graphics	795.00	695.00
460G with Graphics	1,394.00	899.00
560G New full size	1,695.00	1,139.00
DIABLO (LETTER QUALITY)		
630 RIOT bi-directional		
tractors	2,965.00	2,350.00
1640K109 keyboard		
tractors	4,000.00	2,899.00
630 RO Receive Only		
1650K 136 keyboard	2,710.00	2,250.00
tractors	4,000.00	3,100.00

MONITORS

BMC	List	Our Price
Grn. Phs. 12"	275.00	165.00
NEC Grn. Phs. 12"	225.00	179.00
Zenith 12"	159.00	119.00
LE MONITOR	List	Our Price
9" B & W	179.00	159.00
9" Green Phs	189.00	165.00
12" B & W	209.00	185.00
12" Green Phs.	229.00	199.00
12" Green Phs.	199.00	159.00
• Anti Reflective Screen		
• T.V. Grade Screen		
SANYO MONITORS	List	Our Price
13" Color (new)		
high quality	550.00	388.00
12" Green Phs.	360.00	240.00
12" B & W	340.00	217.00
15" B & W	370.00	235.00
9" B & W The Best Seller!	235.00	145.00

**1 Year Extended
WARRANTY**
Inquire

**XEROX 820****WORD PROCESSING SYSTEM
(INCLUDES SOFTWARE)**

OUR PRICE **\$2649.00** Save 846.00
MSL 3495.00

TERMINALS

TELEVIDEO	List	Our Price
910	\$ 699.00	\$ 599.00
912C	950.00	699.00
920C	995.00	795.00
950C	1,195.00	949.00

DISKETTES SOLD IN BOXES OF 10

(Min. Purchase) \$100	List	Our Price
DYLAN	PRICE PER DISKETTE	
104/1 5" SOFT SECTOR	6.00	3.99
104/1D " " DBL.		
DEN.-SOFT SEC.	6.40	4.60
3740/1 8" SOFT SECTOR	7.25	4.75
3740/1D 8" DBL.		
DEN.-SOFT SECTOR	10.75	6.90
MAXELL		
MD-1 5" SOFT SEC-		
TOR/DBL. DEN.	5.00	3.50
MD-2 " SOFT		
SECTOR/DBL. SIDE/DBL.	7.00	4.90
DEN.		
FD-1 8" SOFT SEC./DBL.	6.50	4.50
DEN.		
FD-1 8" SOFT SEC./DBL.	8.50	5.95
SIDE/DBL. DEN.		

DRIVES

CORVUS	List	Our Price
5 MBYTES	3,750.00	\$3,050.00
10 MBYTES	5,350.00	\$4,449.00
20 MBYTES	6,450.00	\$5,325.00

SOFTWARE

FOR APPLE II*	List	Our Price
Apple Fortran	200.00	\$ 147.00
DOS 3.3 (16 Sector)	60.00	45.00
Apple PILOT (16 Sector)*	150.00	119.00
Apple FORTAN*		
(requires A2B0006)		
(16 Sector)	200.00	159.00
Language System with		
Apple Pascal*	495.00	399.00
BPI General Ledger System	395.00	319.00
BPI Inventory Package	395.00	319.00
Visicalc	200.00	159.00
Desktop Plan II	200.00	159.00
MicroLab Database System	150.00	119.00
Stoneware DB Master	229.00	189.00
Muse SuperText II	150.00	119.00
Softape Magic Window	99.00	72.00

**Commodore
VIC-20**

Vic-TV Modem	\$19.00
Vic Cassette	\$69.00
Vic Disk Drive	\$ Call
Vic 6 Pack program	\$44.00

MSL 299.00 OUR PRICE **\$255.00** Save 44.00

SOFTWARE

FOR COMMODORE	List	Our Price
Ozz-The Information Wizard	395.00	\$289.00
Wordcraft 80	395.00	289.00
Ima-Info Retrieval & Mgmt. Aid	495.00	389.00
Dow Jones Portfolio Mgmt.	149.00	219.00
Pascal Development Pkg.	295.00	569.00
Ebs-Receivables, Inventory	750.00	389.00
Bpi-General Ledger	385.00	389.00
Word Pro 3-40 Column	250.00	175.00
Word Pro 4-80 Column	375.00	259.00
Word Pro 4 Plus	450.00	319.00

MODEMS

NOVATION CAT MODEM	List	Our Price
NOVATION D-CAT	189.95	140.00
NOVATION APPLE-CAT	199.00	150.00
HAYES MICROMODEM	349.00	310.00
HAYES SMARTMODEM	379.00	295.00
	279.00	239.00

CALCULATORS

CASIO	List	Our Price
HR-10 Paper Feed	49.95	39.00
HR-12 Paper Feed	54.95	42.00
FR-100 Paper Feed	79.95	59.00
FR-1210 Paper Feed	129.95	99.00
PQ-20	29.95	23.00
LC-785	12.95	10.00
FX-68 Scientific	12.95	10.00
FX-81 Scientific	19.95	17.00
FX-3600P Scientific	39.95	29.95
FX-602P "Computer Talk" 88 Memories Pro		
gramming Upper & Lower Case Dot		
Matrix 512 Step	129.95	99.00
FX-702P Solves Problems with Alpha-		
Numeric Clarity, uses Basic		
Language	199.95	159.00



TELE. ANSW. DEVICES	List	Our Price
PHONE MATE		
900	119.95	86.00
905 Remote	199.95	144.00
910	159.95	115.00
920	199.95	144.00
925 Remote	239.95	173.00
930 Remote	299.95	216.00
935 Remote	339.95	245.00
960 Remote	399.95	288.00

**MICRO BUSINESS WORLD
MAIL ORDER**

WAREHOUSE

18720 Oxnard, #108 Tazana, CA 91356

OUTSIDE CA CALL TOLL FREE 1 (800) 423-5886 IN CA (213) 996-2252

Name (Please print) _____

Address _____

City _____ State _____ Zip _____

Qty Make Model Description Price Total

☐ Certified Check or M.O. ☐ Allow 2 weeks clearance for personal check

☐ Bank Wire Transfer ☐ VISA ☐ MasterCard

CREDIT CARD # _____

Exp. Date _____ Signature _____

Telex: 182852

Answer: MICRO TZNA

TAX IF APPLICABLE*

SHIPPING & HANDLING**

TOTAL ENCLOSED \$

*California residents add 6% sales tax

**add 3% Shipping & Handling - Add

3% surcharge for credit cards. Orders

cannot be shipped unless accompanied

by payment, including shipping, handling

and tax where applicable

VISA MasterCard

Signature

SOFTWARE UPDATE

Since the software uses 20k, there is an increase in available memory for application programs. All application development is performed within Apple DOS using Applesoft BASIC. The program incorporates MDBS, so it supports both a host-language interface and a query interface that allows data retrieval with a single English-like statement.

The Z65 also offers control over data redundancy, automatic-data integrity and security enforcement, automatic-transaction logging and recovery and data-base restructuring.

The Z65 package with a Z80 cpu card is available for \$1600. Without the card the software is \$1500.

For more information: Micro Data Base Systems, P.O. Box 248, Lafayette, IN 47902; (317) 448-1616.

CIRCLE 169

Directory Formatter

Directory Master is a machine-language utility for the Apple II. It lets a user customize disk catalogs for a more professional look.

The program allows a user to create diskette headers and catalog titles containing normal, inverse, flashing and/or control characters. Any number of file names may be hidden so that they cannot be seen when the disk is cataloged.

In addition, the program allows a user to recover files that have been accidentally or intentionally deleted from a disk. Any range of files may be locked, unlocked or deleted with a few keystrokes. Files may also be "expunged" from the disk, wiping the disk clean as if they had never existed. All changes are written directly to the disk being modified, elimi-

nating the need for INITing a new disk or creating POKE files.

Written in Applesoft, the program requires either an Apple II Plus, an Apple II with language card or Applesoft in ROM. It works with either one or two disk drives. Separate versions are available for DOS 3.2.1 and DOS 3.3.

The price is \$39.95.

For more information: Micro-SPARC Systems, P.O. Box 325, Dept. P, Lincoln, MA 01773; (617) 259-9710.

CIRCLE 170

LEISURE/HOME

Diet Program

COMPUCAL is a diet program for use on the TRS-80 Model I or III. The package consists of two pro-

Reliable Business Bookkeeping Software

IN ITS 6th SUCCESSFUL YEAR

NOW FOR TRS-80 MOD III

ORDER ENTRY	\$350
GENERAL LEDGER	140
ACCOUNTS PAYABLE	140
ACCOUNTS RECEIVABLE ..	140
INVENTORY CONTROL	140
PAYROLL/PERSONNEL	140

Inquire for prices on other versions

Also Available for:
IBM, NEC, OSBORNE, XEROX
TRS-80 MOD I, TRS-80 MOD
II, ATARI, APPLE, VECTOR,
EXIDY, DYNABYTE, MICRO-
SOFT CP/M®, CBM DOS 2.0,
MICROPOLIS, SUPERBRAIN

CP/M is a trademark of Digital Research

ASK US ABOUT MICROTEACH

- Simple effective programs designed for *your* machine
 - Step by step instructions, beneficial to the novice as well as to the more experienced user, accompany every program
 - The Source Code is provided with each program
 - You will have a product you'll be able to use from the day you receive it and as your company grows in size
 - One phone call will get you same week delivery
 - Best of all our programs are interactive.
- THEY ALL WORK TOGETHER!!**

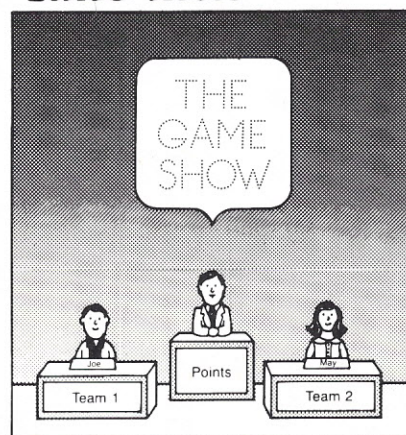
See your dealer or order direct
for a full line of **COMPUMAX** Software

COMPUMAX

P.O. BOX 1139, PALO ALTO, CA 94302 (415) 854-6700

CIRCLE 83

Tune in...



Your celebrity partner will help you guess mystery words!

THE GAME SHOW includes 15 subject areas and offers:

- 1 & 2 player animated graphics
- An enjoyable way to learn
- An author system for adding new topics
- A backup diskette & a full year warranty

Available now at \$39

Educational Software for your Apple II* or II+ by

COMPUTER-ADVANCED IDEAS, INC.
1442A Walnut Street Suite 341
Berkeley, CA 94709
(415) 526-9100

*Apple II is a trademark of Apple Computer Inc.

CIRCLE 85

WHY PLAN 80?

PLAN80™ is a new system that takes the big business, big computer approach to computer modeling and adapts it to smaller computers, which are inherently more friendly and responsive.

If you are not already familiar with the world of financial modeling you will soon wonder how you managed without a system like PLAN80. If you are familiar with the art you will find it incredible that a microcomputer can do so much of what has previously been the domain of million dollar machines.

**PLAN80 WILL DO 99% OF THE JOBS DONE BY
COMPUTER MODELING SYSTEMS COSTING \$50,000**

SB-80 and Software Desk Reference are trademarks of Lifeboat Associates
PLAN80 is a trademark of Business Planning Systems CP/M-80 is a trademark of Digital Research, Inc.
Copyright © 1981, by Lifeboat Associates

CIRCLE 66

Check your interests:

- ☐ Profit Planning
- ☐ Cash Management
- ☐ Acquisition Analysis
- ☐ Market Simulation
- ☐ Resource Allocation
- ☐ Lease vs Purchase Analysis
- ☐ Purchase Price Trends
- ☐ Balance Sheet Projection
- ☐ Cost Center Budgeting
- ☐ Productivity Trend Analysis
- ☐ Sales Projection and Analysis
- ☐ Marketing Strategy Development
- ☐ Capital Project Evaluation
- ☐ Headcount Analysis and Control
- ☐ Cost and Variance Analysis
- ☐ R&D Project Evaluation
- ☐ Energy Accounting
- ☐ Cost Estimating
- ☐ Consolidations
- ☐ Tax Planning

☐ Please send more information about PLAN 80

☐ Please send a free Software Desk Reference™

Dealer, Distributor, and OEM inquiries invited

Please note: All Lifeboat Associates microcomputer software requires SB-80™ or other CP/M-80® compatible operating system.

NAME _____

TITLE _____

PHONE _____

COMPANY _____

STREET _____

CITY _____ STATE _____ ZIP _____ 3209

For More Information, contact

**LIFEBOAT
ASSOCIATES**

1651 Third Avenue
New York, New York 10024

Tel: (212) 860-0300

TWX: 710-581-2524 (LBSoft NYK)

Telex: 640693 (LBSoft NYK)

Shack-80 Model-1 Users:

Restore Reliability

Tired of spontaneous re-booting, "loss" of memory, UL ERROR on programs that are correct, "BAD RAM" or ROM that is good and other symptoms of dirty edge connectors?

CIE Cramolin cleaning kit lets you quickly, safely strip away coatings of high-resistance oxide films built upon .S-80's non-gold-plated edge fingers, and coat them to reduce further buildup. Contains one bottle cleaner, one lubricant/sealer.

CIE Cramolin \$8.95 (\$9.49 CA)

Silver Solder Rejuvenates

Shack-80 Edge Connectors

Ratty Radio Shack edge fingers require frequent Cramolin cleaning for system reliability. Tandy did not gold plate them, but after you silver them you can tug cables and jar computer without system reboot!

Kit contains special high-quality flux and 16" (about 1.5 oz) of solder, 5-6% silver, balance tin (contains no cadmium, zinc, or lead). Caution: do not resolder fingers with ordinary solder, or system will be totally unusable!

CIE \$4.50 (\$4.77 CA)

Media Buys:

Diskettes

5" Unbranded, single-density, 10, in envelopes, fully guaranteed	\$19.95*
5" Memorex singl dens., box 10	\$24.75*
5" Memorex dbl. dens., box 10	\$26.55*
5" Dysan, plastic box of 10, double-density ultra-reliable	\$44.95*
5" Wabash SSSD with hub ring	\$26.55*
5" Wabash DSDD with hub ring	\$38.98*
Reinforcements, 50 rings for 5"	\$7.75*
Ring tools--apply reinforcements	\$4.95*
Cleaning kits, 3M or FD, 2 disks	\$22.46*

GUARANTEE:

All CIE disks guaranteed
If you get a bad disk, CIE will replace it

Hardware:

Percom, LNDoubler Savings

DOUBLE DENSITY attachments
\$153.50/\$157.50/\$207*

Double disk storage with either Percom or LNW Research plug-in adapters. No soldering. Percom Doubler 2 comes with DoubleDOS TRSDOS variant, is \$153.50*. LNDoubler 1 includes DOS-plus deluxe operating system. LNDoubler 5/8, with operating system, allows use of double density with either 5" or 8" drives! just \$207*.

Lowest Prices On Disk Drives!

TEAC 40-track single/double density, single headed (writes, reads on one side of disk), with incredible 1-yr. factory guarantee! Case, power supply disassembled for shipping, just insert 6 screws. Exclusive: no extender cable needed! \$269*.
80-TRACK, 1-HEADED \$395*
80-TRACK, 2-HEADED (dbl sided) \$550*
Bare 40-track, unpowered \$215*
Bare-80-track \$225*

SOFTWARE to 50% off
Leading brands including Acorn, Allen Gelder, Alternate Source, Apparat, Blechman Enterprises, Breeze Computing, CIE, Data Soft, Dorsett, Edu Ware, Ellis Computing, Hexagon Systems, Micro Clinic, Micro Works, Microsoft, Modular Software, Nepenthe, Personal Computer Service, ProSoft, and Ramware.
BOOKS, leading publishers, 10% off

Discounts:

*prices CIE net, including 10% discount for \$50 or more total order, 3 or more items nominal shipping charge on all but books and software

CIRCLE 67

SOFTWARE UPDATE

grams that let the computer count the calories.

The first program provides information on the basis of weight loss via the calorie-reduction method. It shows charts for men and women that help a prospective dieter find an ideal weight and daily calorie requirements. Based on the dieters weight, age, sex and desired final weight, it calculates a daily calorie intake to arrive at this weight in the specified time. It also warns if the weight-loss program is too fast, suggesting a longer period of time. A few typical menus are also furnished.

The second program can be run at the close of each day to help the dieter see how well he met the daily calorie goal. The computer prompts for the food and the quantity if more or less than the standard measure. It then adds up all calories and arrives at a calorie-consumption total for that day. Calorie values for most common foods are included. Additional foods can be added or the dieter can supply calories for non-included foods before the daily total is calculated.

Each program runs in 16k or can be combined to run in 32k as one large program.

The price is \$12 on cassette or \$17 on diskette.

For more information: Practical Programs, 1104 Aspen Dr., Toms River, NJ 08753; (201) 349-6070.

CIRCLE 171

the player's speed in identifying the presidents.

Other features include a slide show that will display portraits without the quiz game, and the ability to change the game clues. The programs require a 48k Apple with a DOS 3.3.

The price is \$39.95 for two double-sided disks.

For more information: Versa Computing, 3541 Old Conejo Rd., Suite 104, Newbury Park, CA 91320; (805) 498-1956.

CIRCLE 172

Galactic Game

Galactic Chase is a space attack and destroy game for one or two players. These players act as captains of a star ship that is the last defender of space.

Available on both disk and cassette for Atari computers with 16k, this game features several levels of skill and graphics capability.

The price is \$24.95 for cassette and \$29.95 for disk.

For more information: Spectrum Computers, 26618 Southfield Rd., Lathrup Village, MI 48076; (313) 559-5252.

CIRCLE 173

Sack Software

VIC SACKS are 10 software packages for the VIC 20 personal computer.

The programs include Cattle Roundup, Artillery, Head On, Snake Out, Chase, Adventure, Micro Maze, Target, Trapper and Hang In. All programs include color graphics and sound.

Each cassette costs \$9.95.

For more information: Computer-Mat, Box 1664, Dept. P, Lake Havasu City, AZ 86403; (602) 855-3357.

CIRCLE 174

Presidential Game

Meet the Presidents is an educational game presenting the 40 U.S. presidents. There are 39 full-color portraits, with high-resolution graphics for the Apple II.

The player is given clues and must type in the correct president's name. When this is accomplished, the portrait is fully revealed and computer music is played. Points are tallied for

NEW LITERATURE

Pocket Dictionary

The International Microcomputer Dictionary is a pocket guide containing definitions of important terms, acronyms (with pronunciation) and numbers used by personal-computer users. In addition, the IMD provides a 10-language vocabulary of essential computer words.

The compact reference contains over 1600 definitions arranged alphabetically. In a separate section, over 200 computer terms are listed with their equivalents in Danish, Dutch, French, German, Hungarian, Italian, Norwegian, Polish, Spanish and Swedish.

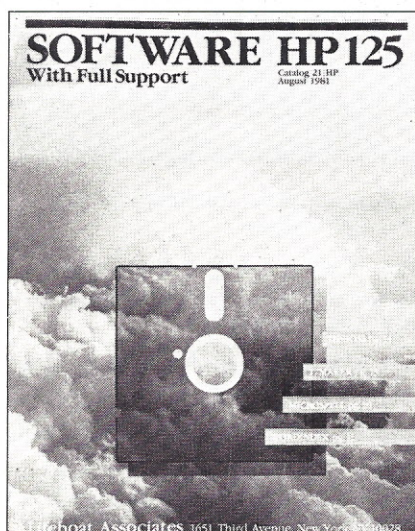
The price is \$3.95.

For more information: Sybex, 2344 Sixth St., Berkeley, CA 94710; (415) 848-8233.

CIRCLE 175

Software Catalog

Software With Full Support For The HP 125 describes nearly 100 programs for use in business, professional and personal applications, and



will be included with HP Business Analyst Computers.

The catalog includes software for financial accounting, data management, mailing list, word processing and telecommunications. It also con-

tains numerical problem-solving tools, system tools, languages, and books and accessories. Prices for the software range from \$100 to \$2500.

The catalog is free.

For more information: Lifeboat Associates, Dept. HP, 1651 Third Ave., New York, NY 10028; (212) 860-0300.

CIRCLE 176

Book for Youngsters

A Young Person's Guide To Computers starts with an abbreviated history of how the computer was developed. The book includes basic elements of a computer, simple explanations of how a computer works, how to talk with and tell a computer what to do, the purpose of flow charts and discussions of the uses of a computer.

The book is heavily illustrated with line drawings and photographs.

The price is \$7.95.

For more information: Scelbi Publications, 35 Old State Rd., Oxford, CT 06483.

CIRCLE 177

Programming for Profit

Playing the Stock & Bond Markets With Your Personal Computer explains the principles of investing and gives advice on setting individual investment goals, how to target profits, time returns, determine degrees of risk and make decisions.

The book also covers specific systems including Apple II, Apple II Plus, PET 2001, Heath H89, HP-85, Intertec Data Systems Superbrain, TRS-80 Model I and Model II and the TI-99/4.

The price is \$16.95 hardbound; \$9.95 paperback.

For more information: Tab Books, Blue Ridge Summit, PA 17214; (717) 794-2191.

CIRCLE 178



We will meet or beat any price in the U.S.A. on



TRS-80 MICROCOMPUTERS

In fact, no matter what price you see advertised by Micro Management, Perry Oil, Pan American, or any authorized Radio Shack dealer for TRS-80 Computers with pure factory installed memory and full warranty, we'll beat it!



We have consistently offered the complete TRS-80, ATARI, EPSON, APPLE, and MAXELL lines at the best prices in the U.S.A. And we offer the best delivery from the largest inventory in the Northeast. If you're looking for the best prices in the U.S.A., check the others but call Computer Discount of America.

TRS-80 and Radio Shack are trademarks of Tandy Co.

**CALL TOLL FREE:
800-526-5313**

**Computer
Discount
of America**

COMPUTER DISCOUNT OF AMERICA, INC.
15 Marshall Hill Road, West Milford Mall
West Milford, New Jersey 07480-2198
In New Jersey Call 201-728-8080

CIRCLE 70

Mailing list

continued from page 89

more fields you use, the fewer total records you can store on one disk.

It has a very good "browse" function that allows you to step through records four ways. A search function is also included that locates a specific record based on a string of up to 10 characters—any 10 characters anywhere in each record.

Micro Business System's **Mail List** allows sorting on any of 10 fields, including business name, street, city, state, zip code and a six-letter alpha code. The package also allows you to select subsets to print from any of 100 user-defined categories. It easily merges form letters from the Magic Wand word processor.

Although its sorting function is very flexible, it is based on numbered sort fields which can be more com-

plex than other sorting methods. For example, numbers 1-6 represent the alpha-code field, 7-34 represent the business name field, etc.

In addition, the package has a fixed-format. This is an inexpensive addition for a CP/M-based TRS-80 Model II to go with Magic Wand.

Micro Computer Industries' **CREATE-A-BASE** is an easy to use, but complex mailing list program and includes a simple data-base manager. It requires a \$70 ROM chip to be inserted before you can use it. It is a powerful link to Word Pro word-processing software, and has a flexible report generator.

Step by step

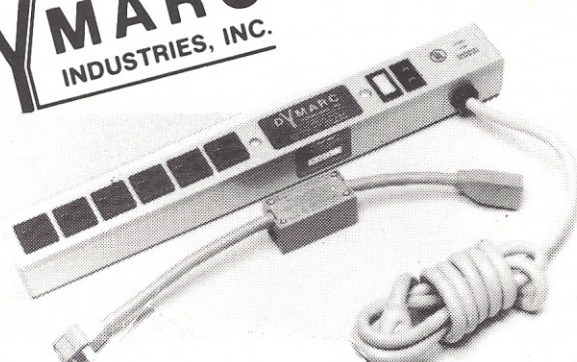
CREATE-A-BASE is one of the programs that allows a two-field sort

from any combination of 10 fields. Its manual is tutorial and is presented simply in step-by-step fashion.

Micro Industries has recently replaced the old search functions with a "Scan/Edit" function that adds a number of capabilities. You scan by matching a short character string, and the program will find and stop on each record that includes that character string. You can also access any file with one command or you can scan by record number.

Printing can be done by standard format which prints only a person's last name, or you can set up a special format to print any field you may want. You can also set the width of that field. You can select and print by either of two code lines.

North Star Computer's **Mail-**



DYMARC INDUSTRIES, INC.

LINE VOLTAGE TRANSIENT SUPPRESSORS

Features Parallel Operation 5000 Hits/Second

Clipstrip™ AND Clipper™

PROTECTS:

- Computers
- Micro-Computer Systems
- Word Processors
- Cash Registers
- Power Supplies

PROTECTS AGAINST:

- High Energy Voltage Transients
- On-Off Switching
- Lightning Induced Transients
- Inrush of On/Off Power

DYMARC INDUSTRIES, INC.

DEALER INQUIRIES INVITED

7133 Rutherford Rd. Baltimore, Md. 21207

(301) 298-3130

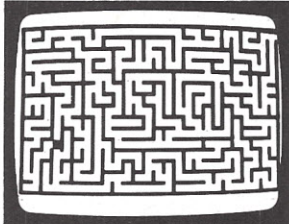
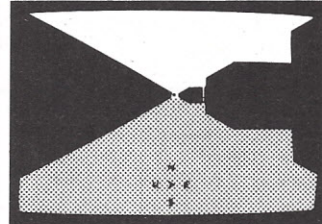
Clipstrip 977E Clipper 678F

LISTED LISTED

800-638-9098

CAPTIVITY

the most advanced maze game available to the ATARI® owner

A new game by Craig Patchett which uses machine language routines, 5-color, high-resolution graphics and sound effects.

The player's goal is to guide an imaginary robot through and out of a 3-dimensional maze.

20 game variations insure countless hours of enjoyment.

CAPTIVITY can be used with any **ATARI®** computer with at least 24K. It is available in cassette format only. Price is \$24.95 plus \$2.00 shipping and handling.

Available at fine computer stores or write us directly.

PDI

Program Design, Inc. 11 Idar Court Greenwich, CT 06830
203-661-8799

ATARI® is the registered trademark of ATARI, Inc.

NEED A PRINTER?

UP TO 25% DISCOUNTS! — SAME DAY SHIPMENT!

CENTRONICS 739

With Graphics and
Word Processing Print Quality

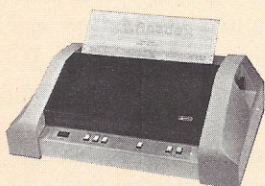


- 18 x 9 dot matrix; suitable for word processing • Underlining • proportional spacing • right margin justification • serif typeface • 80/100 CPS • 9 1/2" Pin Feed/Friction feed • Reverse Platen • 80/132 columns • Top of form

CENTRONICS 739-1 (Parallel) (List \$955) **\$725**
CENTRONICS 739-3 (Serial) (List \$1045) **\$815**
GRAPPLER™ Apple graphics interface **\$Call**

ANADEx

Dot Graphics, Wide Carriage

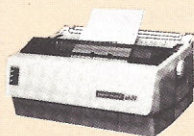


- 11 x 9 dot matrix; lower case descenders • Dot resolution graphics • Bi-directional, logic seeking • Up to 200 CPS • RS 232 Serial & Parallel • Forms control • X-ON/X-OFF • Up to 6 part copy.

ANADEx 9501 (List \$1650) **\$Call**
GRAPPLER™ Apple graphics Interface **\$Call**

C. ITOH STARWRITER

Daisy Wheel Letter Quality



- 25 CPS (Optional 45 CPS) • Typewriter quality • Centronics parallel • RS 232 Serial (Optional) • Proportional spacing • Bidirectional • Programmable VFU • Self test • Diablo compatible • Friction feed (Optional tractors) • 136 printable columns • Manufactured by TEC.

C. ITOH STARWRITER (List \$1895) **\$1525**

SUPER PRICES

IDS PAPER TIGERS

Dot Resolution Graphics,
quality print, speed

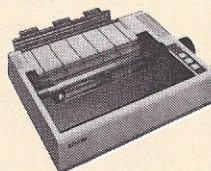


- 9 wire printhead (460) with lower case descenders • Over 150 CPS • bi-directional, logic seeking • 8 character sizes; 80-132 columns • Adjustable tractors • High-resolution dot graphics • Proportional spacing & text justification

IDS 460G 9 wire printhead, graphics (List \$1094) **\$Call**
IDS 560G wide carriage, graphics (List \$1394) **\$Call**
GRAPPLER™ Apple graphics interface **\$Call**

EPSON MX80/MX70/MX100

Low-Priced
Professional Print Quality



- 9 x 9 dot matrix • Lower case descenders • 80 CPS • Bidirectional, Logic seeking • 40, 66, 80, 132 columns per line • 64 special graphic characters: TRS-80 Compatible • Forms handling • Multi-pass printing • Adjustable tractors

We also carry a full line
of Epson Accessories.

EPSON MX80 (& MX80FT) (List \$645) **\$Call**
EPSON MX70 Dot graphics, 5 x 7 matrix (List \$450) **\$Call**
EPSON MX100 wide carriage, graphics (List \$945) **\$Call**

GRAPPLER™ Apple Graphics Interface **\$Call**

GRAFTRAX 80 • MX80 Dot Graphics **\$95**

NEW

NEC 8023 DOT MATRIX

- Dot graphics • 100 CPS • Bi-directional, logic-seeking • Tractors & friction feed • 5-Alphabet fonts • 8 character sizes • Proportional spacing

NEC 8023 DOT MATRIX (List \$795) **\$Call**

NEC SPINWRITER

High Speed Letter Quality

- 55 CPS • Typewriter quality • Bidirectional • Plotting • proportional spacing.

7710RO, Serial (List \$3055) **\$2575**
7730RO, Parallel (List \$3055) **\$2575**

TELEVIDEO CRT'S

AT DISCOUNT PRICES!



TVI 910
TVI 912C
TVI 920C
TVI 950

Please Call Toll Free
Prices are too low to
advertise

QUANTITY PRICING AVAILABLE

CRT'S

ADDS VIEWPOINT (List \$ 699) **\$600**

PRINTERS

MALIBU 200 wide carriage, graphics, letter quality (List \$2995) **\$1325**
QUME SPRINT 9 **\$Call**
DIABLO 630 **\$Call**
ANACOM 150. (List \$1350) **\$Call**

INTERFACE EQUIPMENT

EPSON ACCESSORIES **\$Call**

TRS-80 CABLES to keyboard or Exp. interface **\$Call**

NOVATION D-CAT direct connect modem **\$180**

HAYES MICROMODEM (Apple II) **\$Call**

CALL FOR INFORMATION & CATALOG

(800) 854-8275

CA, AK, HI (714) 630-3322

RETAIL PRINTER STORES:

Store #1 3150 E. La Palma, #1, Anaheim, CA (714) 630-3622

Store #2 13604 Ventura Bl., Sherman Oaks, CA (213) 501-3486

Store Hours: M-F 10-6 Sat. 10-4

CIRCLE 87

Copyright © 1981 by Orange Micro, Inc.



**Orange Micro
inc.**

3150 E. LaPalma, Suite G, Anaheim, CA 92806

"The Computer Printer Specialists"



Phone order WELCOME; same day shipment. Free use of VISA & MASTER-CARD. COD's accepted. Manufacturer's warranty included on all equipment. Prices subject to revision.

Manager comes with a large manual that combines the mail-list manual with introductory manuals to its Horizon computer.

The program itself has a combined format with three defined lines and six free lines, or a default format. Its capacity is directly related to the size of the eventual format as well as to disk density. It includes an easy character-based search, and a unique "hard-copy" echo that prints any entry or transaction that adds to, modifies or deletes a record.

Among its printing functions, the most unusual is its report generator. This prints all of the information, including special comment or code lines, or a sample or selection of specific records. You can also find out the status of the disk and an index of the formats.

Peachtree Software's **Mailing Address System** features automatic

sorting and posting, flexible record formatting, and external- and select-code functions. It also identifies duplicate files or files with the same names, so you can decide whether or not to delete them.

It searches only by name, and sorts by name, zip code and external code, a special code name or number for listing purposes. The select code lets you design and implement up to 12 one-character codes which you define in terms of your interests.

Program versatility

Prodigy Systems **Mailing List System** is versatile and flexible, with 1024 user-defined categories in an array. You can search and select with any combination of categories for extremely precise mailings.

It prints by alphabetical or zip-code order, so you must first pull out the specific categories and subsets

before you print. It also includes a sophisticated form-letter merging operation.

Radio Shack's **Mailing List II** is a program with a capacity of 3000 names, with compressed record sizes. It will merge up to eight fields from each record with letters and documents from Scripsit, a word processor and a second disk drive.

The package will print letters and envelopes with return addresses, a unique feature of this program. It automatically posts records on both alphabetical and zip-code order, and uses eight categories you define for searching, sorting and printing. It has a fixed format with only one comment line.

Software Sorcery offers **Mailing List**, an inexpensive program with an average per disk capacity. You can carry a file from one disk to the next for practically limitless capacity in

TERMINALS FROM TRANSNET

PURCHASE PLAN • 12-24 MONTH FULL OWNERSHIP PLAN • 36 MONTH LEASE PLAN

	DESCRIPTION	PURCHASE PRICE	12 MOS.	24 MOS.	36 MOS.
DEC	LA36 DECwriter II	\$1,095	\$105	\$58	\$40
	LA34 DECwriter IV	995	95	53	36
	LA34 DECwriter IV Forms Ctrl.	1,095	105	58	40
	LA120 DECwriter III KSR	2,295	220	122	83
	LA120 DECwriter III RO	2,095	200	112	75
	VT100 CRT DECscope	1,695	162	90	61
	VT101 CRT DECscope	1,195	115	67	43
	VT125 CRT Graphics	3,295	315	185	119
	VT131 CRT DECscope	1,745	167	98	63
	VT132 CRT DECscope	1,995	190	106	72
TEXAS INSTRUMENTS	TI8XAC Personal Computer Option	2,495	240	140	90
	TI745 Portable Terminal	1,595	153	85	58
	TI765 Bubble Memory Terminal	2,595	249	138	93
	TI Insight 10 Terminal	695	67	37	25
	TI785 Portable KSR, 120 CPS	2,395	230	128	86
	TI787 Portable KSR, 120 CPS	2,845	273	152	102
	TI810 RO Printer	1,695	162	90	61
	TI820 KSR Printer	2,195	211	117	80
	ADM3A CRT Terminal	595	57	34	22
	ADM5 CRT Terminal	645	62	36	24
LEAR SIEGLER	ADM32 CRT Terminal	1,165	112	65	42
	ADM42 CRT Terminal	1,995	190	106	72
	DT80/1 CRT Terminal	1,695	162	90	61
DATAMEDIA	DT80/3 CRT Terminal	1,295	125	70	48
	DT80/5L APL 15" CRT	2,295	220	122	83
	920 CRT Terminal	895	86	48	32
TELEVIDEO	950 CRT Terminal	1,075	103	57	39
	Letter Quality, 7715 RO	2,895	278	154	104
NEC SPINWRITER	Letter Quality, 7725 KSR	3,295	316	175	119
	2030 KSR Printer 30 CPS	1,195	115	67	43
GENERAL ELECTRIC	2120 KSR Printer 120 CPS	2,195	211	117	80
	Executive 80/20	1,345	127	75	49
HAZELTINE	Executive 80/30	1,695	162	90	61
	MX-80 F/T Printer	745	71	42	27
EPSON	MX-100 Printer	895	86	48	32

FULL OWNERSHIP AFTER 12 OR 24 MONTHS • 10% PURCHASE OPTION AFTER 36 MONTHS

MICROCOMPUTERS

APPLE • COMMODORE • HP85 • DEC LSI 11

ACCESSORIES AND PERIPHERAL EQUIPMENT

ACOUSTIC COUPLERS • MODEMS • THERMAL PAPER • RIBBONS • INTERFACE MODULES • FLOPPY DISK UNITS



TRANSNET CORPORATION
1945 ROUTE 22 • UNION, N.J. 07083 • (201) 688-7800
TWX 710-985-5485

CIRCLE 76



Riverbank Software Inc.

PROUDLY INTRODUCES

INTERNATIONAL GRAN PRIX

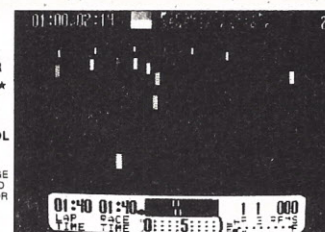
an arcade-like race car simulation

by RICHARD ORBAN

author of THREE MILE ISLAND*

REQUIRES
APPLE II ** OR
APPLE II PLUS **
48K, 13 OR 16
SECTOR DISK,
PADDLE CONTROL

VISA/MASTERCARD
MONEY ORDERS/COD
DEALER/DISTRIBUTOR
INQUIRIES INVITED



\$30.00 PER DISK
MD. RESIDENTS ADD 5%
U.S. CURRENCY ONLY
See your local dealer

INQUIRIES AND
ORDERS: 301-478-1312
SMITH'S LANDING ROAD
POST OFFICE BOX 128
DENTON, MD. 21629

SPECIAL FEATURES •

Five GRAND PRIX-style road circuits, including: Oulton Park, Warwick Farm, Karlskoga, and Monaco • Five speed manual or automatic transmission (with or without cruise control) • Eight levels of difficulty.

ADDITIONAL FEATURES •

Speeds to 198 MPH • controlled skids • spinouts • spectacular crashes • hair pin turns • narrow corners • obstacles • identified circuit features • number of laps selection • flashing last lap indicator • 'Christmas tree' controlled start • switch for silent operation • blue post marks 300' intervals • best lap/best race times posted • fully instrumented control panel: lap timer • race timer • indicator lights • edge detectors • position indicator • steering indicator • moving speed tape • lap counter • gear and RPM indicators • operating fuel gauge

RIVERBANK WILL REPLACE DAMAGED DISKS WITHIN 1 YEAR OF PURCHASE. RETURN DISK WITH PROOF OF PURCHASE PLUS FIVE DOLLARS POSTAGE AND HANDLING FOR IMMEDIATE REPLACEMENT (TEN DOLLARS OVERSEAS)

*TRADEMARK MUSE CO., BALD, MD. • APPLE COMPUTER, INC., CUPERTINO, CA.

CIRCLE 77

FREE SHIPPING

(ONLY IN CONTINENTAL U.S.)

MODEL III DISK KITS

TWO 40/track drive kit and hardware. Comes complete with all the necessary hardware and 2 drives of your choice, (MPI or TANDON 40 track). NO SOLDERING OR TRACE CUTTING REQUIRED! COMPLETE EASY TO FOLLOW INSTRUCTIONS INCLUDED **875.95**



TWO 80/track drive kit and hardware. Same as above **1,095.00**

ONE 40/track drive kit with all hardware and your choice of MPI or TANDON 40/track drive. (INSTRUCTIONS INCLUDED) **599.99**

ONE 80/track drive kit with all hardware and one MPI 80/track drive. No soldering! (INSTRUCTIONS INCLUDED) **699.99**

TRS-80 MODEL III, 48K, 2 40 Track TANDON or MPI drives **2,095.99**

TRS-80 MODEL III, 48K, 2 80 Track MPI drives **2,325.99**

1 YEAR WARRANTY

16 K MEMORY 19.95

MODEL I, III APPLE AND EXIDY. Instructions included. (MOD 1 Keyboard requires jumpers. \$2.00 extra)

ARCHBOLD SPEED-UP MODIFICATION FOR MOD I TRS-80. RUN UP TO 300% FASTER CPU SPEED! SPEED UP SLOW PROGRAMS WITHOUT SOFTWARE! **45.00**

MONITORS

Black and White Monitors 12" (TECO) **129.95**

Green Phosphor Monitors 12" (TECO) **159.95**

AMDEK Black and White 12" Monitor **159.95**

AMDEK Green Phosphor 12" Monitor 100G **189.95**

MODEL I DISK DRIVES

These drives come complete with power supply and chassis. 90 day warranty on disk drives. ALL DRIVES COMPLETELY TESTED PRIOR TO SHIPPING! 40 track drives are fully compatible with TRSDOS, NEWDOS-80, LDOS etc.

Fully compatible with the PERCOM DOUBLER and Double density! 80 track drives require MAKE-80 program to run regular software. (SPECIAL! GET A FREE 2 DRIVE CABLE WHEN BUYING 2 or more DRIVES!)

40 TRACK MPI or TANDON DRIVES **319.95**

80 TRACK MPI **439.95**

DOUBLE SIDED 80 TRACK MPI **579.95**

2 DRIVE CABLES **25.95**

4 DRIVE CABLES **35.95**

SPECIAL DOUBLE SIDED CABLES (CALL \$)

MAKE-80 CONVERT 40 TRACK TO 80 TRACK.

(SPECIFY MOD I, III) **29.95**

DISKETTES

SPECIAL: Brown Bag Diskettes (Verbatim) Bag of 20 **49.95**

SPECIAL: Brown Bag Diskettes 100 Quantity **214.00**

VERBATIM DATALIFE DISKETTES Box of 10 **32.50**

VERBATIM DATALIFE DISKETTES 100 Quantity **275.00**



SPECIAL DISK HOLDER

Holds 50 Diskettes

Reg. Price \$35.95

SPECIAL

\$21.95

PERCOM DOUBLER II (Includes DBLDOS) Doubles storage on Model I disk drives. Installs in Exp. Int. in minutes! Will not effect normal operation! **169.95**

NEWDOS-80 (New Version 2) **139.95**

LDOS **139.95**

DOSPLUS 3.3 **89.95**

(Specify Mod I or III)

LYNX TELEPHONE MODEM

AUTO/DIAL AUTO/ANSWER.

COMPLETE WITH SOFTWARE AND HARDWARE FOR MODELS I AND III



The RS-232 is not needed! Completely assembled. LYNX MODEMS are compatible with

ST-80 III also **299.95**

ST-80 III: Smart terminal program. Allows saving data to disk or sending data from disk and more! Mod I or III ... **149.95**

PRINTERS

SPECIAL: FREE CABLES AND FREE SHIPPING WITH ALL PRINTERS!

CABLES FOR MODEL I EXPANSION INTERFACE, MOD III, or PMC-80 EXP 100 or PIF-40 only.)

PLEASE SPECIFY WHICH COMPUTER!

HIGH QUALITY DOT MATRIX

EPSON MX-80 (Tractor feed only) **539.95**

EPSON MX-80 FT (Tractor and Friction feed) **639.95**

EPSON MX-70 (Tractor feed only) **419.95**

EPSON MX-100 (Tractor and Friction feed 14.5 wide) **895.95**

EPSON MX-80 Hi-Res Graphics Option **89.95**

Add-On Friction Feed Adaptor for MX-80 or MX-70 **59.95**

OKIDATA MICROLINE 80 (Friction and Pin feed) .. **414.95**

OKIDATA MICROLINE 82 (Friction and Pin feed) .. **597.95**

OKIDATA MICROLINE 83 **897.95**

(Friction, Pin and Tractor feed 14.5")

OKIDATA MICROLINE 82A. 120 cps **625.00**

(9x9 matrix w/descenders)

OKIDATA MICROLINE 83A. 120 cps **925.00**

(9x9 matrix w/descenders)

TRACTOR FEED ADAPTOR for 80 and 82 **75.00**

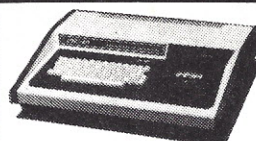
LETTER QUALITY PRINTERS

The C-itoh Daisy wheel printer is one of the finest Letter Quality printers we've seen. WHY PAY MORE FOR LESS??? Exchange Daisy wheels to get the kind of printing fonts you need. 12-10 pitch. Excellent with Scripsit or Electric pencil. Let's face it, sometimes dot matrix doesn't hack it! (You can use standard Diablo Carbon ribbons with the C-itoh to get crisp "COPY READY" printouts!)

C-ITOH DAISY WHEEL 25 CPS **1,795.25**

C-ITOH DAISY WHEEL 45 CPS **1,995.25**

C-ITOH TRACTOR FEED **219.95**



PMC-80 COMPUTER

16K LEVEL II Fully compatible with all TRS-80 Mod I Software **595.95**

PMC-81 COMPUTER 16K LEVEL II

with upper/lower case. Upper/lower case driver in ROM. Auto key repeat. Numeric keypad.

4 programmable keys. Built in speaker. 100% Mod I software compatible **679.99**

EXPANDER 100 PMC's expansion interface 32K, disk controller, printer interface.

(Expands PMC-80/81 to 48K) **499.99**

RF-MODULATOR for PMC or TRS-80 to TV Hook-up. Completely assembled and tested. (Plugs in Video port) UHF CH.33 **39.95**

TRS-80 Disk and Other Mysteries Book, 132 pp **22.50**

Microsoft Basic Decoded and Other Mysteries, 312 pp **29.95**

Custom TRS-80 and Other Mysteries, 300 pp **29.95**

CALL TOLL FREE: 800-528-1149

NO SURCHARGE FOR VISA, MASTER CARD OR AMERICAN EXPRESS!!!

(10% DEPOSIT REQUIRED ON C.O.D.'S OVER \$200.00) Send Certified Check, Money Order or Check.

SIMUTEK COMPUTER PRODUCTS INC.

4877 E. SPEEDWAY

TUCSON, AZ 85712

(602) 323-9391

CALL FOR

FREE 100+ PAGE

CATALOG!!!

TRS-80 IS A TM OF TANDY CORP. PMC-80 IS TM OF PERSONAL MICROCOMPUTERS. PRICES AND SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

BUSINESS COMPUTING

each file. Much of the program is written in machine language so it responds to commands, searches and sorts very quickly—as quickly as two seconds for 500 entries.

It prints envelopes as well as labels, and you can print by any range of letters or zip codes, or with a 15-character "wild card" code. Its format is fixed with seven fields, and it will merge and print form letters with the company's own form-letter program.

Instant access

Stonehenge Computer's **Commercial Mailer** is a hard disk-based program designed for a small-business that deals in thousands of mailings a week. Its manual reproduces screens of menus and procedures and explains each step carefully and clearly. It is one of the best packages for a company where clerical workers will

have to learn and use this program on their own.

Although the package is one of the best for small businesses, it does have drawbacks. There is no easy escape from a secondary menu or function to the main or primary menu. Another problem is a lack of information about what's on the disk. You must browse through entries first and then go back through the system to a specific record to make changes.

This browse function is useful if you don't know a surname or a zip code. Its default-entry feature is excellent. Although the feature is not essential, the program will also print each screen full of information as it appears on the monitor.

The program will merge files and has a "search for anything" that comes in handy.

Synergistic Software's **Mailing List/Data Base** uses very fast

machine-language routines for sorts, searches and record keeping. It has a limited file capacity of 215 names, but has a simple main menu and good sort and search functions. You can search for specified records in four ranges such as all current records, all files on disk, all files on a second disk and all files on both disks. It will search by a substring, one field and two fields, which is a very flexible combination.

The program will sort on up to three fields and list or print only those fields. The first sort is alphanumeric, while the other two are field-based, such as zip code and first name combined. It prints in six ways, including at a distinct starting point.

Synergistic's manual is short and in booklet form, but it is well-written, professionally laid out and includes all of the information you need to use the program. 



MALA

Educational
Computer
Subscriptions
Program

VIC

COMMODORE

GAMES

PET

COMPUTER

COMM*DATA

SYSTEMS, INC.

P.O. BOX 325
MILFORD, MICHIGAN 48042
(313) 685-0113

32 programs
\$48

FREE
Educational Catalog
Summary Available

SHOP 'n SAVE at



MANNFRED

EVERYBODY ELSE DOES!

OK MACHINE & TOOL

- Digital Logic Probe #PRB-1 \$33.25
- Dip IC Insertion Tools With Pin Straightener #INS-1416 3.14
- Wire Dispenser—Blue, Yellow, White or Red #WD-30 4.45
- Tri-Color Dispenser #WD-30-TRI 7.15
- Tri-Color Dispenser Replacement Rolls #R-30-TRI 5.35
- Wire Dispenser Replacement Rolls—Blue, Yellow, White, or Red #R-30-0050 2.68

HOBBY-BLOX

- Basic Integrated Circuit Starter Pack #490 \$5.37
- Basic Discrete Component Starter Pack #480 5.91
- Blank Panel Pack #550 1.52
- Control Panel Pack #545 1.52
- Distribution Strips #510 1.79
- Discrete Component Strip #515 2.69
- Tray Extender Clips #570 1.16
- Bus Strip #520 2.69
- 3x16 Terminal Strip #525 2.69
- Binding Post Strip #560 3.23
- Terminal Strip Pack #505 2.69

ECO AUTOSOUND PRODUCTS

- Cassette Stereo Tape Player & Pushbutton AM/FM Stereo Radio #C-220 \$56.95
- Cassette Stereo Tape Player & AM/FM Stereo Radio #C-230 42.95
- Auto-Reverse Cassette Stereo Tape Player & AM/FM Stereo Radio #C-225 65.95
- 8-Track Stereo Tape Player & AM/FM Stereo Radio #C-250 45.95
- Teknika Wireless Remote Control #6301 119.95

VIDEO TAPES

- AMPLEX • SONY • ZENITH • JVC
- L250 2 for \$18.00
- L500 2 for 21.50
- L750 2 for 27.50
- L830 2 for 28.00
- T-120 2 for 28.00

NIGHT SENTRY
SOLID STATE TIMER
\$19.95 3 @ \$15 ea.

TEL/ANSWER/MACHINES
RECORD-A-CALL
#60 Remote #80
\$114.95 214.95

BECKMAN DIGITAL MULTI-METERS
0.5% Accuracy #300 \$102.00
0.25% Accuracy #310 123.35
0.1% Accuracy #330 186.15

**Ademco Burglar & Fire Alarm Supplies...
Now at Rock-Bottom Prices!**

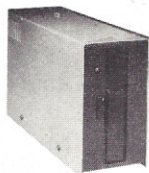
**Warner Communications Pre-Recorded
First Line Movies** WRITE FOR OUR CATALOG - THE PRICE IS RIGHT!

**CALL FOR SPECIAL DAY-TO-DAY QUOTES ON ENTIRE LINE OF
COMMODORE & ATARI COMPUTERS**
WE SHIP BY U.P.S. - C.O.D., CASH OR CERTIFIED CHECK

MANNFRED ELECTRONICS CORP.
60-10 KISSENA BLVD., FLUSHING, N.Y. 11355
TOLL FREE (800) 221-0466 HOURS 9AM - 4PM E.S.T.

WE WILL NOT BE UNDERSOLD

DISK DRIVES



FOR TRS-80* Model I
CCI-100 5 1/4", 40 Track (102K) \$299

ADD-ON DRIVES FOR ZENITH Z-89
CCI-189 5 1/4", 40 Track (102K) \$389
Z-87 Dual 5 1/4" system \$995

External card edge and power supply included. 90 day warranty/one year on power supply.

CORVUS 5 mg \$3089 10 mg \$4489 Mirror \$699
RAW DRIVES 8" SHUGART 801R \$399
5 1/4" TANDON \$CALL POWER SUPPLIES \$CALL

DISKETTES

Box of 10
5 1/4" Maxell \$40 BASF/Verbatim \$26.95
8" Maxell \$45 BASF/Verbatim \$36.00
PLASTIC FILE BOX—Holds 50 5 1/4" diskettes \$19.00
PLASTIC LIBRARY CASE 5 1/4" \$3.00 8" \$4.00
HEAD CLEANING DISKETTE \$25.00
FLOPPY SAVER \$10.95 RINGS \$6.95

16K RAM KITS

200ns for TRS-80; Apple II, (specify): 2 for \$37 \$19
Jumpers \$2.50

COMPUTERS/SYSTEMS

ALTOS ACS8000 Series \$CALL
ZENITH 48K, all-in-one computer \$2149
ATARI 400 \$359
800 \$789
APPLE PERIPHERALS \$CALL

TERMINALS

ADDS Viewpoint \$CALL
ZENITH Z-19 \$719
TELEVIDEO 910 \$559
920C \$729
950 \$929



S-100 CALIFORNIA COMPUTER SYSTEMS

MAINFRAME \$349 Z80 CPU \$239
64K RAM \$569 FLOPPY DISC CNTRL \$339
INTEGRATED SYSTEM W/INTERNAL CABLES, TESTED \$1975

2P + 2S I/O \$269
4 PORT SERIAL I/O \$249
4 PORT PARALLEL I/O \$179
CABLES \$CALL



CASIO CALCULATORS

POCKET COMPUTER FX702 \$199.00
DESK PRINTER/CALCULATOR FR100 \$79.95
SCIENTIFIC CALCULATOR FX8100 \$49.95
GAME WATCH CA90 Plastic \$49.95
GAME WATCH CA901 Steel \$69.95
SPORT WATCH AX210 Calendar \$59.95

BUSINESS SOFTWARE

WORDSTAR for Apple II \$329
WORDSTAR for Zenith Z89 \$329

For fast delivery, send certified checks, money orders or call to arrange direct bank wire transfers. Personal or company checks require two to three weeks to clear. All prices are mail order only and are subject to change without notice. Call for shipping charges.

PRINTERS



NEC SPINWRITER
7710 R.O. Par \$2395
7710 R.O. Par w/tractor \$2595
7720 KSR w/tractor \$2795
7730 R.O. Ser \$2395
7730 R.O. Ser w/tractor \$2595
NEW 3500 Series \$CALL
EPSON MX-70 MX-80 MX-80FT MX100 \$CALL
PAPER TIGER
IDS 445 Graphics & 2K buffer \$CALL
IDS 460 Graphics & 2K buffer \$CALL
IDS 560 Graphics \$CALL

ACCESSORIES
ANADIX DP-8000 \$849 DP-9500/01 \$1389
OKIDATA

Microline 80 Friction & pin feed \$CALL
Microline 82A Friction & pin feed \$CALL
Microline 83A 120 cps, uses up to 15" paper \$CALL
Call for new Microline series!

CENTRONICS 739, new model with graphics \$739
C. ITOH
Starwriter I 25 cps, parallel interface \$1525
Starwriter I 25 cps, serial interface \$1620
Starwriter II 45 cps, parallel interface \$1950
Starwriter II 45 cps, serial interface \$2075
AXIOM GP-80M \$319
DATA SOUTH 180 cps \$CALL
OLIVETTI DY 211 Daisy Wheel \$CALL

MONITORS

BELL & HOWELL 9" B & W BHD911 \$125
LEEDEX 12" B & W \$129 12" Green Screen \$155
13" Color \$329
SANYO 9" B & W \$149 12" Green Screen \$238
12" B & W \$219 13" Color \$399
ZENITH 13" Color \$349 12" Green Screen \$129

TELECOMMUNICATIONS

PRENTICE STAR MODEM 1-year guarantee \$125
UNIVERSAL DATA SYSTEMS UDS103LP \$149 UDS103JP \$215
NOVATION CAT \$139 D-CAT \$149
AUTO-CAT \$199 APPLE CAT II \$339
D.C. HAYES SMART/STACK MODEM \$249
MICRO-MODEM II \$295
CCI Telnet Communications Package \$135

APPLE ACCESSORIES AND SOFTWARE

Mfr. by: Microsoft - Mountain Computers - Videx - CCS - Personal Software
VISICALC \$159.00 VISIDEX \$159.00
VISITERM \$119.00 VISIPILOT \$139.00
Z-80 SOFTCARD \$259.00 VIDEX BOARD \$249.00
KEYBOARD ENHANCER \$110.00 16K CARD \$159.00
APPLE JOYSTICK \$49.00 SUP-R FAN \$39.00
SUP-R MOD \$25.00 CCS CARDS \$CALL
APPLE CARDS \$CALL ASCII EXPRESS \$59.00
SUPERCALC \$199.00 ALF9 VOICE BOARD \$149.00
CPS MULTIFUNCTION CARD \$199.00
METACARD 8088 MICROPROCESSOR FOR APPLE \$CALL

ENTERTAINMENT

Mfr. by: On Line - Broderbund - Sirius - California Pacific
FLIGHT SIMULATOR \$29.00 SARGON II \$29.00
WIZARD & PRINCESS \$28.00 ABM \$21.95
MYSTERY HOUSE \$24.00 GORGON \$34.95
HI-RES FOOTBALL \$35.00 MICROPainter \$29.00
RASTER BLASTER \$25.95 APPLE PANIC \$27.95
SPACE EGGS \$17.95 POOL 1.5 \$25.95

DEALER (NATIONAL/INTERNATIONAL) INQUIRIES INVITED

Send for FREE Catalogue

The CPU SHOP

TO ORDER CALL TOLL FREE 1-800-343-6522

TWX: 710-348-1796 Massachusetts Residents call 617/242-3361

420-438 Rutherford Ave., Dept. KOIM
Charlestown, Massachusetts 02129
Hours 10AM-6PM (EST) Mon.-Fri. (Sat. till 5)

Technical Information call 617/242-3361
Massachusetts Residents add 5% Sales Tax
Tandy Corporation Trademark® Digital Research

CIRCLE 81



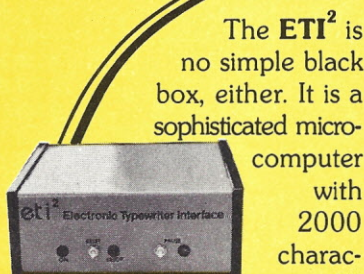
Save \$2500⁰⁰

Are you faced with having to spend \$3000 and up for a letter-quality printer?

Mediamix offers an alternative.



For only \$500 the **Mediamix ETI²** lets you connect the IBM Electronic Typewriter Models 50, 60, or 75 to **any** computer. Why invest in two separate machines? Your office typewriter can do both jobs, yielding better type quality, a consistent corporate image and renowned IBM service.



The **ETI²** is no simple black box, either. It is a sophisticated micro-computer with 2000 characters of memory, over 39 special commands and the option of doing typesetting on the IBM Model 50.

Write or Call

MEDIAMIX

P.O. Box 67B57
Los Angeles, California 90067
(213)475-9949

PROFESSIONAL COMPUTING

Market research

continued from page 48

many people would be needed to work in various service industries? For dozens of questions like these, Mastrobatista had to find answers extending all the way to 1990.

"I don't know how I could have done it without the computer," she says. The project was "expensive." Without the computer, it would have been prohibitively expensive because of the enormous amount of additional time that would have been involved, if it could have been done at all.

Filling 10 disks with information, she calculated and recalculated, running through every reasonable variation. The algebra was simple. Once she established the base year, she could give the computer a possible number of tourists for a given year, and the computer would alter the other areas affected by that change. By filling in one variable, she was able to quickly find the values for the other variables.

Projected over different growth levels, and accumulating the projections for 10 consecutive years, Mastrobatista was able to deliver to the client a detailed picture of what to expect in each area of the islands tourist economy at any given growth rate for a particular year.

At Laventhol & Horwath, Mastrobatista has picked up two years of experience on the personal computers, but has had no previous computer background. Neither was she an accounting and numbers person. Her training had been in hotel management. The Cayman Islands project has been so successful that the company is looking to apply her method to other hotel, travel, tourism and resort areas.

"The client was amazed," she states. What the research uncovered was that the Cayman Islands were somewhat over-prepared for tourism. The islands would have to increase the number of tourists faster than

they would have to develop other facilities, if tourism was to catch up with the condominium construction and other development that had been going on unplanned. Now the client has market research which can be used as a basis for future development plans. Without the personal computer, it might never have been done.

A personal nature

It is doubtful that the data-processing houses and large conventional market-research firms should fear any loss of business because of people turning to personal computers to provide market research. It will be a long time, if ever, before a personal computer has the power, speed and complex statistical capabilities to handle the masses of information usually required in traditional market research.

More importantly, the nature of personal computing is different from what is required for mass market research. What personal-computer user wants to take the time to input the results from hundreds or thousands of questionnaires, each containing dozens of questions? Who wants to do all the coding required for that kind of work?

The great advantage of the personal computer in market research, says Alan Sneider, the man who first brought an Apple computer into Laventhol & Horwath, is the ability to ask, "What if?" You can take the market-research data you have compiled from whatever source you can get it, use it to fill in VisiCalc's appropriate rows and columns, and you can then start massaging the figures, asking "what if," and probing for new insights.

That is creative market research, good business and exciting personal computing. You can't do that (very easily) with a mainframe. 

EAST/WEST

INTERTEC SUPERBRAIN 64K RAM	\$2799
QD SUPERBRAIN	\$2999
NEC 5510 SPINWRITER (7710)	\$2345
NEC 5520 SPINWRITER (7720)	\$2695
NEC 5530 SPINWRITER (7730)	\$2345
NEC 12" MONITOR	\$ 229

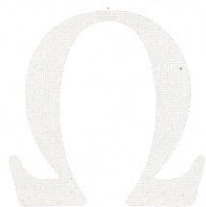
We
accept
C.O.D.'s
Stock Shipments
Same Day or Next • No
surcharge for Credit Cards

Ω OMEGA SALES CO.

All Equipment Factory
Fresh w/MFT Warranty
We carry the
complete line of
Personal
Software

OKIDATA MICROLINE-80	\$ 399
OKIDATA MICROLINE-82	\$ 529
OKIDATA MICROLINE-83	\$ 769
DIABLO 630	\$1995
APPLE II PLUS 48K	\$1139
APPLE DISK w/3.3 DOS Controller	\$ 525
APPLE DISK w/o Controller	\$ 449
HAZELTINE 1420	\$ 799
NORTHSTAR HORIZON II 32K QD	\$2925
ANADIX DP-9500/9501	\$1249
TELEVIDEO 912C	\$ 669
TELEVIDEO 920C	\$ 729
TELEVIDEO 950	\$ 929
CBM 8032 COMPUTER	\$1149
CBM 8050 DISK DRIVE	\$1349
CBM 4032 COMPUTER	\$1029
CBM 4040 DISK DRIVE	\$1029
CBM 4022	\$ 649
CBM VIC-20	\$ 269
LEEDEX/AMDEK 100	\$ 139
LEEDEX/AMDEK 100G	\$ 169
LEEDEX/AMDEK COLOR-1 13" Color Monitor	\$ 329
MICROTEK 16K RAMBOARD for Atari	\$ 79
MICROTEK 32K	\$ 149

EAST COAST
1-800-556-7586



WEST COAST
1-800-235-3581

PRICES ARE SUBJECT TO
CHANGE WITHOUT NOTICE.



\$749

Buy an ATARI 800 16K

(Actual size
Genuine 14K 24.95 retail)

ATARI SPECIALS

ATARI 400 16K Personal Computer \$349

ATARI PERIPHERALS

410	Program Recorder	\$ 60
810	Disk Drive	\$449
820	40 Column Printer	\$299
822	40 Column Thermal Printer	\$349
825	80 Column Printer	\$599
830	Acoustic Modem	\$159
850	Interface Module	\$139

ATARI ACCESSORIES

CX852	8K RAM Memory Module	\$39.95
CX853	16K RAM Memory Module	\$89.95
CX30-04	Paddle Controller (pair)	\$15.00
CX40-04	Joystick Controller (pair)	\$15.00

With any purchase of ATARI Hardware or Software over \$500
you can buy the bracelet for only \$9.95.

WE CARRY THE COMPLETE LINE OF ATARI SOFTWARE.

WEST COAST
1-800-235-3581

OMEGA SALES CO.
3533 Old Conejo Rd. #102
Newbury Park, CA 91320
1-805-499-3678
CA. TOLL FREE 1-800-322-1873



EAST COAST
1-800-556-7586

OMEGA SALES CO.
12 Meeting St.
Cumberland, RI 02864
1-401-722-1027

OMEGA SALES CO.

PROGRAM LISTINGS

Astronomy

This program runs on an Apple II Plus.

continued from page 36

```

1  REM *****
2  REM * THE RELATIONSHIP
3  REM * OF STARS IN SPACE
4  REM * BY
5  REM * HAROLD W. MILLER
6  REM * 1124 N. PROSPECT
7  REM * SPRINGFIELD, MO. 65
8  REM *****
9  REM *****
10 HOME
11 VTAB 10: PRINT TAB( 15);"STA
12 RS N.N"
13 VTAB 15: PRINT TAB( 12);"HAR
14 OLD W. MILLER"
15 VTAB 18: PRINT TAB( 16);"3/9
16 /81"
17 FOR N = 1 TO 2000
18 NEXT N
19 DIM A$(30): DIM B$(30): DIM C
20 $(30): DIM E$(30)
21 FOR J = 1 TO 22: PRINT : NEXT
22 J
23 REM THE PROPER DESIGNATION
24 REM REFERS TO THE GREEK LET-
25 TER
26 REM AND THE THREE-LETTER
27 REM ABBREVIATION FOUND IN MA
28 NY
29 REM ALMANACS AND ASTRONOMY T
30 EXTS.
31 INPUT "DO YOU WISH TO SEE A S
32 PECIFIC CONSTELLATION? (USE
33 THE PROPER THREE LETTER DESI
34 GNATION) ";E$
35 PRINT : PRINT : PRINT : PRINT
36 : PRINT
37 IF E$ = "" THEN 120
38 REM INPUT THE DECLINATION
39 REM AND RIGHT ASCENSION
40 REM IN DECIMAL DEGREES.
41 REM INPUT DISTANCE IN
42 REM LIGHT YEARS.
43 PRINT "GIVE ME THE NAME,RA(D
44 D),DEC(DD),DIST(LY). "
45 HGR
46 INPUT A$,GM1,PH1,R1
47 FOR M = 1 TO 159 STEP 5: HPL0T
48 139,M: NEXT M
49 FOR K = 1 TO 279 STEP 5: HPL0T
50 K,79: NEXT K
51 IF A$ = "SUN" THEN GOTO 175
52 REM AFTER THE ANGLES ARE
53 REM CONVERTED TO RADIANS,
54 REM THE ANGLE AND DISTANCE
55 REM ARE USED AS THE VECTOR
56
57 REM REPRESENTATION OF THE
58 REM STAR'S POSITION.
59 GM1 = GM1 / 57.29578:PH1 = PH
60 1 / 57.29578
61 REM THE MATHEMATICAL
62 REM FORMULAE CAN BE FOUND
63 REM IN "THE VNR CONCISE
64 REM ENCYCLOPEDIA OF
65 REM MATHEMATICS", GALLERT
66 REM ET AL,VAN NOSTRAND
67 REM REINHOLT, NEW YORK,
68 REM 1977
69
70 X1 = R1 * COS (PH1) * COS (
71 GM1):Y1 = R1 * COS (PH1) *
72 SIN (GM1):Z1 = R1 * SIN (P
73 H1)
74 READ B$,GM2,PH2,R2
75 IF E$ = "" THEN 240
76 IF B$ = "9999" OR E$ = "9999
77 " THEN GOTO 1820
78 IF E$ < > RIGHTS (B$,3) THEN
79 GOTO 200
80 IF B$ = A$ THEN GOTO 200
81 IF B$ = "9999" THEN GOTO 18
82 50
83 GM2 = GM2 / 57.29578:PH2 = PH
84 2 / 57.29578
85 X2 = R2 * COS (PH2) * COS (
86 GM2):Y2 = R2 * COS (PH2) *
87 SIN (GM2):Z2 = R2 * SIN (P
88 H2)
89 X3 = X2 - X1:Y3 = Y2 - Y1:Z3 =
90 Z2 - Z1:R3 = SQR (X3 ^ 2 +
91 Y3 ^ 2 + Z3 ^ 2)
92 PH3 = ATN (Z3 / ( SQR (X3 ^
93 2 + Y3 ^ 2))):PH3 = PH3 * 57
94 .29578
95 PH3 = INT (PH3 * 960 + .5) /
96 1000
97 IF X3 > 0 AND Y3 > 0 THEN GM
98 3 = ATN (Y3 / X3) * 57.2295
99 78
100 IF X3 < 0 THEN GM3 = (3.1415
101 96 + ATN (Y3 / X3)) * 57.29
102 578
103 IF X3 > 0 AND Y3 < 0 THEN GM
104 3 = (2 * 3.141596 + ATN (Y3
105 / X3)) * 57.29578
106 PRINT B$: PRINT " RA
107 DEC DIST": PRINT "
108 ";GM3;" ";PH3;" ";R3
109
110 REM THE LAST LINE LISTS
111 REM THE NAMES OF THE STARS
112 REM AS THEY ARE PLOTTED.
113 REM IT CAN BE DELETED IF
114 REM YOU WISH.
115 GM3 = (279 / 360) * (360 - GM
116 3):PH3 = (159 / 180) * ABS
117 (PH3 - 90)
118 IF GM3 < 0 THEN GM3 = ABS (
119 GM3)
120 IF GM3 > 279 THEN GM3 = GM3 -
121 273
122 IF SQR (GM3 ^ 2 + PH3 ^ 2) <
123 1 THEN GOTO 200
124 HPL0T GM3,PH3: GOTO 200
125 REM DATA LIST PARTIALLY
126 REM FORMULATED BY AUTHOR,
127 REM PARTIALLY DRAWN UP
128 REM FROM THE 1981 EDITION
129 REM OF THE "WORLD ALMANAC
130 REM AND BOOK OF FACTS."
131 REM 'GE' REFERS TO GAL-
132 REM ACTIC EQUATOR. THESE
133 REM ARE POINTS NEAR THE EDG
134 E OF THE GALAXY.
135 DATA "GE1",265.654167,-23,1
136 14170
137 DATA "GE2",280.654167,2.5,1
138 13373
139 DATA "GE3",295.654167,28,11
140 1005
141
142 DATA "GE4",310.654167,44,10
143 7128
144 DATA "GE4",325.654167,54,10
145 1856
146 DATA "GE5",340.654167,58,95
147 349
148 DATA "GE7",355.654167,63,87
149 822
150 DATA "GE8",10.654167,63.5,7
151 9608
152 DATA "GE9",25.654167,62,710
153 94
154 DATA "GE10",40.654167,58,62
155 868
156 DATA "GE11",55.654167, 52.5
157 ,55740
158 DATA "GE12",70.654167,42,50
159 749
160 DATA "GE13",85.654167,23,48
161 930
162 DATA "GE14",100.654167,-2,5
163 0749
164 DATA "GE16",130.654167,-43,
165 62868
166 DATA "GE17",145.654167,-53,
167 71094
168 DATA "GE18",160.654167,-59,
169 79608
170 DATA "GE19",175.654167,-62,
171 87832
172 DATA "GE20",190.654167,-63.
173 5,95349
174 DATA "GE21",205.654167,-62,
175 101856
176 DATA "GE22",220.654167,-58,
177 107128
178 DATA "GE23",235.654167,-52,
179 111005
180 DATA "GE24",250.654167,-42,
181 113373
182 DATA "A AND",1.85,28.98333,
183 90
184 DATA "B CAS",2.025,59.033,4
185 5
186 DATA "A PHO",6.325,-42.4166
187 6,93
188 DATA "A CAS",9.85,56.43333,
189 150
190 DATA "B CET",10.65,-18.1,57
191
192 DATA "B AND",17.15,35.5166,
193 76
194 DATA "A ERI",24.25,-57.333,
195 118
196 DATA "G AND",30.675,42.2333
197 3,260
198 DATA "A ARE",31.5,23.3666,7
199 6
200 DATA "A UMI",32.95,89.167,6
201 80
202 DATA "O CET",34.575,-3.067,
203 103
204 DATA "B PER",46.725,40.883,
205 105
206 DATA "A PER",50.725,49.783,
207 570
208 DATA "A TAU",68.7,16.467,68
209
210 DATA "B ORI",78.4,-8.2167,9
211 00
212 DATA "A AUG",78.8,45.983,45

```


Put Your Fingers On The Pulse Of Wall Street With Your Radio Shack® Computer

If you invest in the market, operate your own business or require updated information quickly to manage your affairs, Dow Jones Information Services provides the authoritative business and financial information you need...from Wall Street, Washington and around the world. Now Radio Shack owners can receive this valuable service through TRS-80® Videotex® software.

Get Information For Business And Investment Control...On Command.

Discover how quickly and easily your personal computer turns into a specialized, sophisticated library of information with access to the Dow Jones database. It's considered the world's most reliable and comprehensive source of business and financial data providing you with news up-to-the-minute as well as from the previous 90 days.

Now you can review thousands of items from *The Wall Street Journal*, *Barron's* and the worldwide Dow Jones News Service without having to maintain piles of newspaper clippings. Information about companies, stocks, labor, government, international market and monetary developments, and so much more, is yours on command.

Quotes From Four Exchanges

Now, in just seconds, you can obtain current prices and the volume traded for stock quotes (15 minutes delayed) on over 6,000 companies...plus 50 key financial indicators on 3,200 selected firms and 180 industries. You'll also have access to trading information on mutual funds, treasury notes and bonds.



Imagine being able to spot trends, research a company, obtain data that could affect your business, your investments, your investment decision-making. But you don't have to imagine anything...Dow Jones Information Services provides it all right now.

Low Start-Up Cost...Free Password.

Stop by your nearest Radio Shack store and find out how easy and inexpensive it is to get Dow Jones investment data through TRS-80 Videotex. Videotex software for Radio Shack computers is only \$29.95. What's more, you get a Dow Jones password absolutely free...along with one hour of free introductory time. And there are no start-up or minimum usage charges. In addition, software and usage costs will be tax deductible in many cases (consult your tax advisor for further information).

Customer Support... Just A Phone Call Away.

Dow Jones' professional customer service staff is ready to provide complete information about this important home information service now...and full customer support after you've made your purchase. Just call toll free...

800-257-5114

**In New Jersey call:
(609) 452-1511.**

TRS-80, Radio Shack, and Videotex are registered trademarks of Tandy Corp.

DOW JONES INFORMATION SERVICES

Providing Information Through Innovation

Dow Jones & Company, Inc.

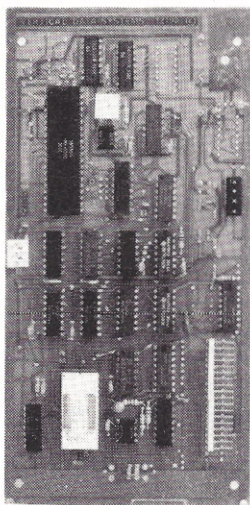
PROGRAM LISTINGS

800 DATA "G ORI",81.025,6.333,4
70
810 DATA "B TAU",81.25,28.6,300
820 DATA "D ORI",82.75,-.3167,1
500
830 DATA "E ORI",83.8,-1.2167,1
600
840 DATA "Z ORI",84.925,-1.95,1
600
850 DATA "K ORI",86.7,-9.683,21
00
860 DATA "A ORI",88.525,7.4,520
870 DATA "B AUR",89.525,44.95,8
8
880 DATA "B CMA",95.45,-17.95,7
50
890 DATA "A CAR",95.875,-52.683
98
900 DATA "G GEM",99.15,16.4167,
105
910 DATA "A CMA",101.075,-16.68
3,8.7
920 DATA "E CMA",104.45,-28.57,
680
930 DATA "D CMA",106.95,-26.367
2100
940 DATA "N CMA",110.825,-29.26
7,2700
950 DATA "A GEM",113.325,31.93,
45
960 DATA "A CMI",114.575,5.283,
11.3

970 DATA "B GEM",116.025,28.083
35
980 DATA "Z PUP",120.725,-39.95
2400
990 DATA "G VEL",122.225,-47.28
3,520
1000 DATA "E CAR",125.75,-59.45
340
1010 DATA "D VEL",131.05,-54.63
3,76
1020 DATA "L VEL",136.825,-43.3
5,750
1030 DATA "B CAR",138.25,-69.63
3,86
1040 DATA "I CAR",139.15,-59.18
3,750
1050 DATA "K VEL",140.375,-54.9
33,470
1060 DATA "A HYD",141.65,-8.567
94
1070 DATA "A LEO",151.825,12.06
7,84
1080 DATA "G LEO",154.725,19.95
90
1090 DATA "B UMA",165.15,56.483
78
1100 DATA "A UMA",165.625,61.86
7,105
1110 DATA "B LEO",177.14,683.43
1120 DATA "G UMA",178.2,53.8,90
1130 DATA "A CRU",186.375,-62.9
83,370
1140 DATA "G CRU",187.5,-57,220

1150 DATA "G CEN",190.1,-48.85,
160
1160 DATA "B CRU",191.625,-59.5
83,490
1170 DATA "E UMA",193.3,56.067,
68
1180 DATA "Z UMA",200.775,55.03
3,88
1190 DATA "A VIR",204.65,-53.36
7,570
1200 DATA "E CEN",204.65,-53.36
7,570
1210 DATA "N UMA",206.7,49.4167
210
1220 DATA "B CEN",210.6,-60.283
490
1230 DATA "T CEN",211.375,-36.2
72,55
1240 DATA "A BOO",213.675,19.28
3,36
1250 DATA "N CEN",218.55,-42.06
7,390
1260 DATA "A CEN",219.55,-60.75
4,3
1270 DATA "A LUP",220.15,-47.3,
430
1280 DATA "E BOO",221.025,27.15
103
1290 DATA "B UMI",222.7,74.233,
105
1300 DATA "A CBO",233.45,26.383
76
1310 DATA "D SCO",239.775,-22.5
67,590

Turn Your Electronic Typewriter Into a Computer Printer...



... For as Little
as \$250

**With a Converter
Electronic Module**

- No Modifications to Typewriter
- Prints at 200+ Words Per Minute
- RS232 or Parallel Versions

**For Information Contact Your Local
Office Equipment Dealer Or:**



VERTICAL DATA SYSTEMS INC.
1215 Meyerside Drive, Unit 2A
Mississauga, Ontario, Canada L5T 1H3
(416) 671-1752

CIRCLE 89

data base

FINALLY, a copiable, user modifiable, flexible data base program for the Apple II or Apple II Plus. The Applesoft source code and the fast machine code sort element are open for user inspection and change. The package is also available with a BASIC language teaching program for use by "non-programmers".

The Features Include:

- 30,000 Word Manual
- 34 Page Annotated Source Listing
- Fast Sort Element (1,000 mailing labels in 3.5 seconds)
- 9,999 Records
- Byte by Byte Access
- File Management Utility
- Report Preparation Utility
- Query/Search Element
- File Transfer Utility
- Free Mailing List, Checkbook Utility, and Inventory Control Program
- (Optional) 17 Lesson Course in BASIC

THE REPROGRAMMABLE DATA
BASE #D-075. \$99.95

THE REPROGRAMMABLE DATA
BASE PLUS (with 17 lesson
BASIC course) #D-076. \$149.95

CHECK YOUR LOCAL DEALER OR CONTACT:

CHARLES MANN & ASSOCIATES
55722 Santa Fe Trail
Yucca Valley, Ca. 92284
(714) 365-9718

CIRCLE 90

INTRODUCING THE SOFTWARE OF THE MONTH CLUB^{T.M.}



Software of the Month Club^{T.M.} - A revolutionary new way to buy name brand software. Available only through Microcon SoftwareCenters, the "Unhardware" Store.

Choose from dozens of front-line products at a 33% discount and purchase two more over the next six months at discounts of up to 30%.

SOFTWARE OF THE MONTH FEATURE PRODUCTS FOR JANUARY

ENTERTAINMENT

POOL 1.5: One of the finest Hires graphic games available. With sound. Game paddles required. APPLE 48K Disk.....\$23.40

SHUFFLEBOARD: Hires graphic game of challenge and excitement requiring skill and strategy. APPLE 48K Disk.....\$19.95

RACE FOR MIDNIGHT: New exciting Hires adventure game. APPLE 11+\$19.95

HIRES GOLF: New exciting game. Five courses to choose from,

complete control of swing. APPLE 11+\$19.95

ULYSSES OF THE GOLDEN FLEECE: Fast, animated adventure game. Commissioned by the king, search for the elusive Golden Fleece. 48K APPLE 11 or 11+ Disk.....\$23.40

THRESHOLD: Arcade game, fast animation. Command four ships armed with lasers. Beware! Lasers overheat and you carry limited fuel. 48K APPLE 11 or 11+ Disk.....\$19.95

CRANSTON MANOR: Hires graphic adventure. Search for hidden

treasure guarded by the ghost. APPLE 48K Disk.....\$23.40

PLANETOLDS: Defend base from approaching asteroids. With sound. Game paddles required. APPLE 11 Disk.....\$13.40
Tape.....\$ 9.95

PROJECT OMEGA: Adventure game. Develop industrial space colonies in time to save earth. TRS 80 Tape Mod I & III.....\$9.95
TRS 80 Disk Mod I.....\$13.95

MISSILE ATTACK: Protect city with ABM's against enemy missiles.

Game paddles required. TRS 80 Tape Mod I & III.....\$9.95
TRS 80 Disk Mod I.....\$13.95

BUSINESS

HOME ACCOUNTING PACKAGE: Balance up to five checkbooks, print checks, personal balance sheet and net worth, bank reconciliation, complete home financial package. 48K APPLE 11 Disk.....\$49.95

TAX MANAGER: Revisions to comply with new tax laws. Competitive edge at tax time. 48K APPLE 11+ Disk (requires two drives).....\$99.00

ASSET MANAGER: Automatically selects proper depreciation methods, prints tax schedules, prints reports for financial statement. 48K APPLE 11+ Disk.....\$135.00

EDUCATION

SCIENCE PACKAGE I: Exercises in electronics, metric quiz, survival, speed and trajectory. TRS 80 Tape.....\$16.70

BUSINESS PACKAGE I: Provides practice in general ledger accounting and depreciation methods. TRS 80 Tape.....\$16.70

Hundreds of additional products available in our free catalog.

To join the Software of the Month Club^{T.M.} or receive further information and our free catalog, simply fill out the coupon below or call toll free 1-800-343-6214, except in Mass. call 1-617-924-3333.

NOTE: Prices listed are 33% off manufacturers list price. Buy any number of products from current list and order two more within the next six months at special Club member prices. Members will be informed each month of new products and prices. Guaranteed replacement of defective products for 30 days. Substitutions not permitted. Prices valid to February 15, 1982.



SoftwareCenters, Inc.

25 ELM STREET • WATERTOWN, MA 02172

MEMBERSHIP AND INFORMATION FORM

NAME: _____ AGE: _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

SIGNATURE: _____

TYPE OF COMPUTER: _____ OPSYS: _____

☐ 5 1/4" DISK ☐ 8" DISK ☐ TAPE

☐ I wish to join the Software of the Month Club^{T.M.} Please send me the following products at the discount prices listed above. I agree to buy 2 more from your Software of the Month Catalog within the next 6 months. (Buy as many as you like. Simply attach list of additional items.)

☐ Please send me your free catalog. I am particularly interested in _____ (type of software).

PRODUCT

PC 1-82

PRICE

☐ VISA Account # _____

☐ MasterCard Account # _____

Expiration Date: _____

Inter Bank # _____
(MasterCard only)

Mail to: Software of the Month Club • 25 Elm Street • Watertown, MA 02172

Sub-Total \$ _____
shipping and handling + 2.00

5% sales tax for Mass. residents + _____

Total Enclosed check or money order \$ _____

PROGRAM LISTINGS

1320 DATA "A SCO",247.05,-26.38
3,520
1330 DATA "A TRA",251.625,-69.8
2
1340 DATA "E SCO",252.225,-34.2
5,66
1350 DATA "N OPH",257.3,-15.7,6
9
1360 DATA "L SCO",263.05,-37.08
3,310
1370 DATA "A OPH",263.5,12.567,
58
1380 DATA "T SCO",263.975,-42.9
83,650
1390 DATA "K SCO",265.275,-39.0
167,470
1400 DATA "D DRA",269.025,51.48
3,108
1410 DATA "E SAG",275.7,67,124
1420 DATA "A LVR",279.15,38.767
26.5
1430 DATA "S SAG",285.5,-26.318
7,300
1440 DATA "A AQU",297.45,8.8167
16.5
1450 DATA "G CYG",305.375,40.2,
750
1460 DATA "A PAV",306.025,-56.8
310
1470 DATA "A CYG",310.175,45.2,
1600
1480 DATA "E CYG",311.35,33.9,7
4
1490 DATA "A CEP",319.525,62.5,

52
1500 DATA "E PEG",325.8,9.783,7
80
1510 DATA "A GRU",331.75,-47.06
7,64
1520 DATA "B GRU",340.375,-46.9
83,280
1530 DATA "A PAU",344.125,-29.7
33,22.6
1540 DATA "A PEG",345.7,27.967,
210
1550 DATA "B PEG",345.95,15.1,1
09
1560 DATA "LMC1",75,-70,160000
1570 DATA "LMC2",82.5,-72,160000
0
1580 DATA "LMC3",90,-70,160000
1590 DATA "LMC4",90,-67.5,160000
0
1600 DATA "LMC5",82.5,-67.5,160
000
1610 DATA "LMC6",75,-67.5,16000
0
1620 DATA "O UMA",182,57.75,85
1630 DATA "SMC 1",15,-72,200000
1640 DATA "SMC 2",22.5,-74,2000
00
1650 DATA "SMC 3",15,-76,200000
0
1660 DATA "SMC 4",7.5,-74,20000
0
1670 DATA "GAL CEN",265.654,-28
.95,31000

1680 DATA "2 GAL CEN",265.654,-
29.95,31000
1690 DATA "3 GAL CEN",265.654,-
27.95,31000
1700 DATA "AND 1",7.5,40,220000
0
1710 DATA "AND 2",9,40,2200000
1720 DATA "AND 3",7,40,2200000
1730 DATA "SUN",0,0,0
1740 DATA "9999",0,0,0
1750 READ BS,GM2,PH2,R2
1760 GM2 = (279 / 360) * (360 - G
M2):PH2 = (159 / 180) * ABS
(PH2 - 90)
1770 HPLOT GM2,PH2
1780 IF BS = "SUN" THEN GOTO 18
00
1790 GOTO 1750
1800 PRINT : PRINT " STAR MA
P AS SEEN FROM EARTH"
1810 END
1820 IF ES = "ORI" THEN ES = "OR
ION": IF ES = "UMA" THEN ES =
"URSA MAJOR": IF ES = "PER" THEN
ES = "PERSIUS": IF ES = "TAU
" THEN ES = "TAURUS"
1830 IF ES = "AND" THEN ES = "AN
DROMEDA": IF ES = "VEL" THEN
ES = "VELA": IF ES = "CRU" THEN
ES = "CRUSUS": IF ES = "BOO"
THEN ES = "BOOTIS"
1840 IF ES = "UMI" THEN ES = "UR
SA MINOR": IF ES = "CYG" THEN
ES = "CYGNUS": IF ES = "SCO"

SOFTWARE FOR YOUR 16K TRS-80 COLOR MODEL I, III, ATARI 400/800, APPLE II



Do you know all the innovative ways of using Basic commands? The staff at the Programmer's Institute have spent 8 months designing a set of programs explaining everything the manuals omit. And much more.

The Programmer's Program leads you step by step through the fundamentals of programming your computer. Then you explore the finer points... multiple loops, queues, stacks, game programming, sorts, trees, boolean logic, and memory savers. All these methods make your programming tasks easier and more efficient.

Difficult (and very useful) programs are built before your very eyes, and designed so you learn at your own speed! The Programmer's Program is a must for every owner of a microcomputer (\$40)

On cassette or diskette*, our magazines are designed explicitly for your computer. Included every month are 6-10 ready-to-load programs ranging from games, home entertainment, and personal finance, to more of our unique "teaching" programs. We will also keep you informed of the latest hardware, software, and publications compatible with your microcomputer.

Our December issue will include:

- CHECKERS!!
- Algebra Test.
- Concentration Card Game with graphics.
- Computerized Telephone Directory.
- Christmas Carols played by your computer!
- Test your Trivia knowledge.
- Two more of our special "Teaching" Programs!
- ... and as always you get our 100% commitment to excellence and service from the Programmer's Institute.

(Back issues are available!)

Later issues will include backgammon, home budget, forecasting, stock market, and many more. The price per subscription to TRC, APPLETREE, or MAGATARI is \$50 per year, \$30 per 1/2 year, and \$10 for a trial issue. Don't miss out on our December issue.

If you order now, you will receive our complete home accounting system (Reg. 39.95) ABSOLUTELY FREE with any \$50.00 order. Purchase both above packages and your net cost is only \$75.00. This is our Christmas special, so don't wait! ORDER TODAY!!



THE PROGRAMMER'S INSTITUTE

A Futurehouse Company
P.O. Box 3191 Dept. D
Chapel Hill, N.C. 27514
(919) 489-2198
MC & Visa Welcome
Computer Model

name _____
address _____
city/st _____

☐ Year Subscription ☐ both ☐ Trial Issue
☐ Cassette ☐ Diskette

TRC and the programmer's program are trademarks of Futurehouse.

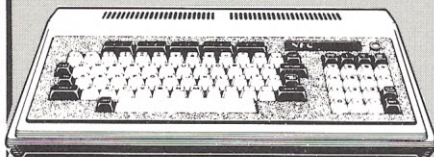
*All software available on cassette for the TRS-80 Model I, Color Extended Basic, Atari 400/800. On diskette for the Model III, Apple II (Add \$5.00 for each diskette order).

U.S. POSTAL SERVICE STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION (Required by 39 U.S.C. 3685)			
1. TITLE OF PUBLICATION PERSONAL COMPUTING		2. DATE OF FILING Oct. 1, 1981	
3. FREQUENCY OF ISSUE Monthly		4. ANNUAL SUBSCRIPTION PRICE \$18.00	
5. COMPLETE MAILING ADDRESS OF KNOWN OFFICE OF PUBLICATION (Street, City, County, State and ZIP Code) (Not printers)			
50 Essex Street, Rochelle Park, N.J. 07662 (Bergen County)			
6. COMPLETE MAILING ADDRESS OF THE HEADQUARTERS OR GENERAL BUSINESS OFFICES OF THE PUBLISHERS (Not printers)			
50 Essex Street, Rochelle Park, N.J. 07662			
7. FULL NAMES AND COMPLETE MAILING ADDRESS OF PUBLISHER, EDITOR, AND MANAGING EDITOR (This item MUST NOT be blank)			
PUBLISHER (Name and Complete Mailing Address) Robert Lydon, 50 Essex Street, Rochelle Park, N.J. 07662			
EDITOR (Name and Complete Mailing Address) David Gabel, 50 Essex Street, Rochelle Park, N.J. 07662			
MANAGING EDITOR (Name and Complete Mailing Address) Susan Foster, 50 Essex Street, Rochelle Park, N.J. 07662			
8. OWNER (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual must be given. If the publication is published by a nonprofit organization, its name and address must be stated.) (Item must be completed)			
FULL NAME		COMPLETE MAILING ADDRESS	
Hayden Publishing Co., Inc.		50 Essex St. Rochelle Park, N.J. 07662	
James S. Mulholland, Jr.		50 Essex St. Rochelle Park, N.J. 07662	
9. KNOWN BONDHOLDERS, MORTGAGEES, AND OTHER SECURITY HOLDERS OWNING OR HOLDING 1 PERCENT OR MORE OF TOTAL AMOUNT OF BONDS, MORTGAGES OR OTHER SECURITIES (If there are none, so state)			
FULL NAME		COMPLETE MAILING ADDRESS	
NONE			
10. FOR COMPLETION BY NONPROFIT ORGANIZATIONS AUTHORIZED TO MAIL AT SPECIAL RATES (Section 411.3 GMM only) The purpose, function, and nonprofit status of this organization and the exempt status for Federal income tax purposes (Check one)			
☐ HAS NOT CHANGED DURING PRECEDING 12 MONTHS ☐ HAS CHANGED DURING PRECEDING 12 MONTHS (If changed, publisher must submit explanation of change with this statement)			
10. EXTENT AND NATURE OF CIRCULATION		AVERAGE NO. COPIES EACH ISSUE DURING PRECEDING 12 MONTHS	
A. TOTAL NO. COPIES (Net Press Run)		52,487	
B. PAID CIRCULATION 1. SALES THROUGH DEALERS AND CARRIERS, STREET VENDORS, AND COUNTER SALES 2. MAIL SUBSCRIPTION		97,735	
C. TOTAL PAID CIRCULATION (Sum of B1 and B2)		15,286	
D. FREE DISTRIBUTION BY MAIL, CARRIER OR OTHER MEANS SAMPLES, COMPLIMENTARY, AND OTHER FREE COPIES		30,778	
E. TOTAL DISTRIBUTION (Sum of C and D)		46,064	
F. COPIES NOT DISTRIBUTED 1. OFFICE USE, LEFT OVER, UNACCOUNTED, SPOILED 2. RETURN FROM NEWS AGENTS		2,446	
G. TOTAL (Sum of E, F1 and F2 - should equal net press run shown in A)		48,510	
H. COPIES OF SINGLE ISSUES LEFT OVER, UNACCOUNTED, SPOILED		96,244	
I. RETURN FROM NEWS AGENTS		3,977	
J. TOTAL (Sum of G, H and I - should equal net press run shown in A)		1,491	
K. TOTAL (Sum of J and K - should equal net press run shown in A)		52,487	
L. TOTAL (Sum of J and K - should equal net press run shown in A)		97,735	
11. I certify that the statements made by me above are correct and complete			
SIGNATURE AND TITLE OF EDITOR, PUBLISHER, BUSINESS MANAGER, OR OWNER David A. Lydon, Editor		Date October 1, 1981	

consumer computers Mail Order DISCOUNTS

**ORDER
TOLL-FREE**

NEC Microcomputer



PC-8001A 32K Computer.....CALL
PC-8012A I/O Unit w/32K RAM.....CALL
PC-8013A Dual Mini-Disk Drive Unit.....CALL
PC-8001 Multi Cardware (FDI/O & 32K).....CALL
CP/M 2.2 Operating System for NEC.....129
WordStar configured for NEC.....299
SuperCalc configured for NEC.....279
NEC Wordprocessor & Accounting Software.....CALL
Many more software packages and languages;
(Pascal, Fortran, Cobol, etc) are available configured for
the NEC 8001A Computer.
Please call or write for a product price list.

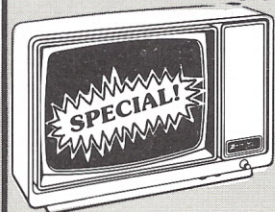


**ATARI
800
16K
\$749**

Atari 400 w/16K.....349
410 Program Recorder.....65
810 Disk Drive.....449
825 80 col. 7x8 Dot matrix impact printer.....699
822 40 col. Quiet Thermal Printer.....349
850 Interface Module.....159
Atari 16K Ram Module.....69
Axlon Ramcam 32K Module.....189

Video Monitors

Amdek/Leedex Video 100 12" B&W.....155
Amdek/Leedex Video 100G 12" Green Phosphor.....179
Amdek (Hitachi) 13" Color w/audio output.....389
NEC 12" Green Phosphor Display JB-1201M.....CALL
NEC 12" Lo-Res Color Display.....CALL
NEC 12" Hi-Res RGB Color Display.....CALL
Sanyo 9" B&W Display.....185
Sanyo 9" Green Phosphor Display.....CALL
Sanyo 12" B&W Display.....269
Sanyo 12" Green Phosphor Display.....285
Sanyo 13" Color Display.....449
Zenith 12" Green Phosphor Display ZVM-121.....149



**ZENITH
12"
GREEN**

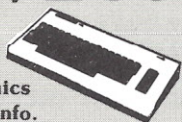
\$149

VIC20™

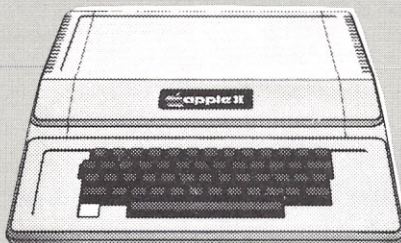
\$259

Personal
Computer

Color * Sound * Graphics
Call or write for more info.
Disk drives available soon!



apple computer
Authorized Dealer



APPLE II PLUS

16K NOW \$1025
48K NOW \$1089
64K* NOW \$1199

*48K Apple with 16K RamBoard



**APPLE DISK
DRIVES
\$439**

w/controller and DOS 3.3 **\$499**

Apple Cards and Hardware

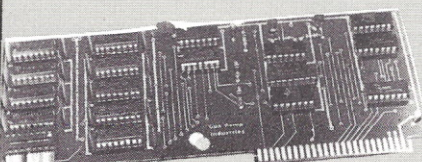
Language System w/Pascal & BASICS.....379
Silentype Printer w/Interface card.....349
Hayes Micromodem II.....239
Novation Apple-Cat.....339
Videx Videoterm 80 column card.....269
Videx Keyboard Enhancer.....115
Z-80 Softcard by Microsoft.....299
16 K RamCard by Microsoft.....169
CPS Multi-function card.....189

Software for the Apple

VisiCalc version 3.3.....159
VisiFile (NEW data base manager).....199
VisiTrend/VisiPlot.....219
DB Master.....169
WordStar (Apple 80 col. version).....249
Dow Jones Portfolio Evaluator.....45
Apple Post.....45
Apple Writer.....65
Dow Jones News & Quotes Reporter.....85
Apple Plot.....60
Tax Preparer.....99
Real Estate Analyzer.....129

16K RAMBOARD by ConComp
for Apple II Computers

\$129⁹⁵
FOR ONLY



AVAILABLE NOW

S-100

California Computer
Systems

Floppy Disk Controller.....\$369
64K Dynamic Ram Board, 200ns.....\$499
Z-80 CPU board w/monitor ROM.....\$269

16K Static memory board, 200ns.....369
32K Static memory board, 200ns.....599
S-100 12 Slot Mainframe.....475
4-Port Serial Interface.....299
2-Port Serial/2-Port Parallel Interface.....299
4-Port Parallel Interface.....229

Printers

Silentype
w/Apple II interface

\$349

Epson
MX-80 or
MX-80 FT
CALL



Anadex 9501 w/2K Buffer.....1349
C. Itoh Starwriter 25 CPS daisywheel.....1449
C. Itoh Starwriter 45 CPS daisywheel.....1649
Epson MX-70.....CALL
Epson MX-80 & MX-80 F/T.....CALL
Epson MX-100.....CALL
NEC 8023 Impact Dot Matrix.....695
NEC Spinwriters (Latest models).....CALL
Paper Tiger IDS-445G w/graphics.....699
Paper Tiger IDS-460G w/graphics.....949
Paper Tiger IDS-560G w/graphics.....1249
Silentype Printer w/Apple Interface.....349
Qume Sprint Daisywheels (Latest models).....CALL

ORDER TOLL FREE
800-854-6654

In California and

outside continental U.S.

(714) 698-8088

Telex 695-000 Beta CCMO

Send Orders To:

Ordering information: Phone orders using VISA, MASTERCARD, AMERICAN EXPRESS, DINER'S CLUB, CARTE BLANCHE, bank wire transfer, cashier's or certified check, money order, or personal check (allow ten days to clear). Unless prepaid with cash, please add 5% for shipping, handling and insurance. (minimum 5.00). California residents add 6% sales tax. We accept CODs. OEM's, institutions and corporations please send for a written quotation. All equipment is subject to price change and availability without notice. All equipment is new and complete with manufacturer's warranty (usually 90 days). Showroom prices may differ from mail order prices.

**consumer
computers Mail Order**

8314 Parkway Drive
La Mesa, Calif. 92041

PROGRAM LISTINGS

```

      THEN E$ = "SCORPIO": IF E$ = .
      "PEG" THEN E$ = "PEGISUS"
1850 PRINT : PRINT TAB( 9);E$;"
      AS SEEN FROM ";A$: END
1860 REM AS YOU CAN SEE, MORE S
      TARS AND THEIR COORDINATES C
      AN BE ADDED.
1870 REM TO DO THIS, ALL ONE HA
      S TO DO IS PUT THE NAME, THA

      T IS THE THREE LETTER DESIGN
      ATOR, IN THE FORM OF A STRIN
      G.
1880 REM THE STARS COORDINATE,
      THE DECLINATION AND RIGHT AS
      CENSION, IN DECIMAL DEGREES.
1890 REM THE STARS DISTANCE IN
      LIGHT YEARS.

2000 REM OBJECTS OTHER THAN STA
      RS CAN BE USED SUCH AS GALAX
      IES, PULSARS, AND QUASARS.
2010 REM THESE LAST TWO OBJECTS
      , BEING BILLIONS OF LIGHT YE
      ARS DISTANT, WOULD SERVE AS
      REFERENCE POINTS THAT WOULD
      NOT APPEAR TO CHANGE EXCEPT
      AT EXTREME DISTANCES.

```

Car Costs

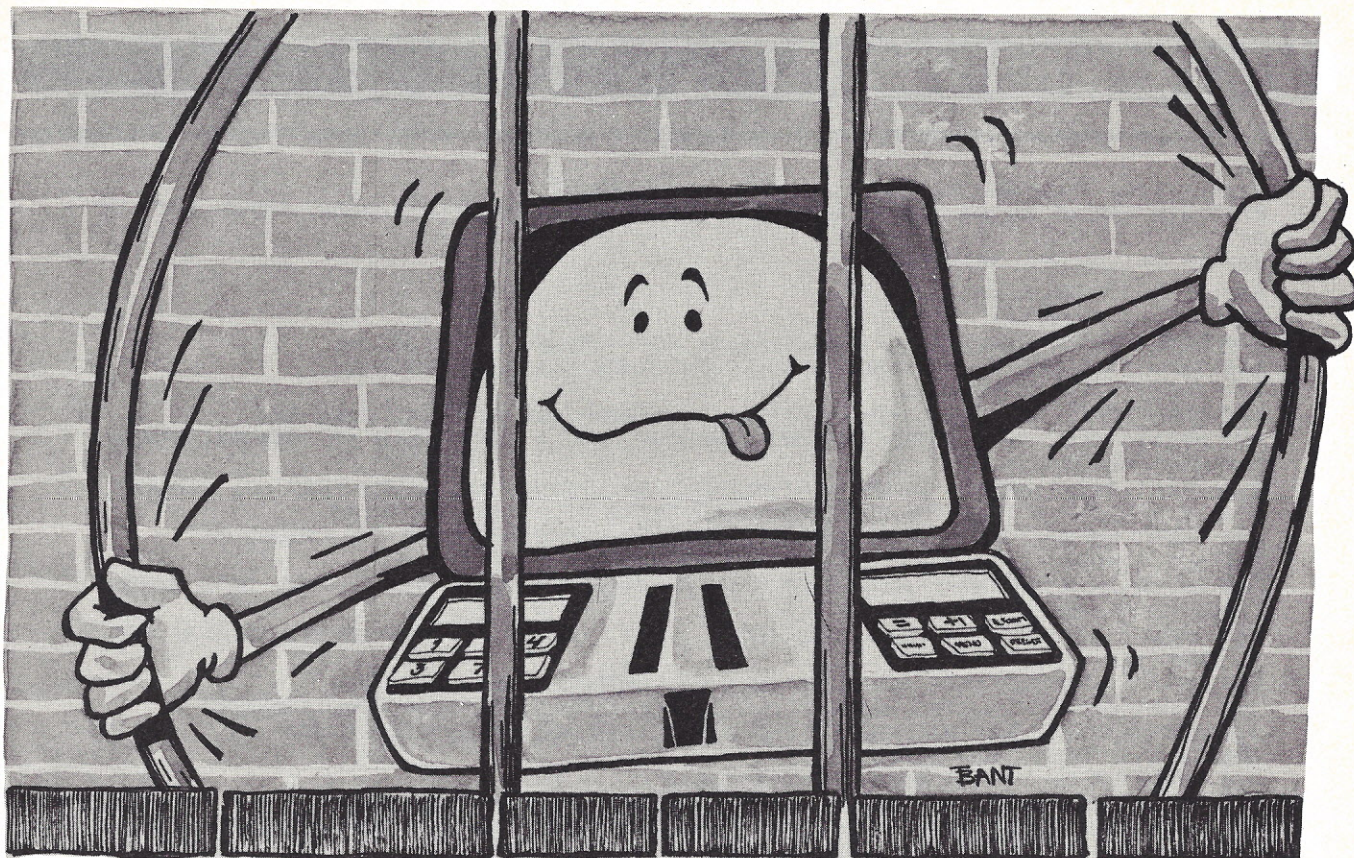
This program runs on a TRS-80 Model I.

continued from page 97

```

10 REM CAR T 6/80
20 CLEAR 20:DIM H(25,5):DEFINT F,I,N,T,X,Y,Z
30 CLS:PRINTTAB(26);"CAR HISTORY"
40 PRINT:INPUT"WHAT IS THE READING ON THE TAPE COUNTER";T:T=T+5
50 PRINT" ADVANCE IT TO";T;:INPUT" READY";R$
60 PRINT:INPUT"PUSH 'PLAY' ON TAPE PLAYER...READY";R$:ON ERROR GOTO90
70 INPUT#-1,M9,D5,M1,M4,M5,M8,C5,I:IF M9=0 THEN 100
80 FOR N=1 TO I:INPUT#-1,H(N,0),H(N,1),H(N,2),H(N,3),H(N,4),H(N,5):NEXT N:GOTO100
90 PRINT:PRINT"TAPE PROBLEM":PRINT"TRY REWINDING THE TAPE TO EXACTLY";T:PRINT:IN
  PUT"READY";R$:GOTO60
100 ON ERROR GOTO830:PRINT:INPUT"PUSH 'STOP' ON TAPE PLAYER...READY";R$:CLS:IF M
  9>0 THEN 210
110 PRINT:PRINT"TO INITIALIZE THE PROGRAM, I'LL NEED SOME INFORMATION -"
120 PRINT:PRINT"WHAT IS TODAY'S DATE - MMDDYY":INPUT"FOR EXAMPLE JULY 4 1985 WOU
  LD BE 070485 - ";D
130 IF D>10000 AND D<123199 THEN H(1,4)=INT(D) ELSE 120
140 PRINT:INPUT"WHAT IS PRESENT MILEAGE READING OF CAR";M9:IF M9<1 THEN 140 ELSE
  M9=INT(M9):H(1,3)=M9
150 PRINT:PRINT"I NEED TO KNOW HOW OFTEN YOU PLAN TO DO OIL CHANGES -":INPUT" D
  ESIRED MILES BETWEEN CHANGES";M8
160 IF M8<1 THEN 150 ELSE M8=INT(M8)
170 INPUT" DESIRED TIME INTERVAL BETWEEN OIL CHANGES IN MONTHS";D:IF D<1 THEN 1
  70 ELSE D5=INT(D)*10000
180 PRINT:PRINT"YOU PLAN TO DO OIL CHANGES EVERY";M8;"MILES OR ";
190 PRINT"EVERY";INT(D);"MONTHS.":PRINT:INPUT"CORRECT - 'YES OR NO' (Y/N)";R$:IF
  R$="N" THEN 150 ELSE IF R$<>"Y" THEN 180
200 M1=M9:M4=M9:M5=M9:I=1:Z=1:GOTO690
210 PRINT:PRINT"FILL UP WITH GAS? NOTE - DO NOT ENTER GAS PURCHASES UNLESS"
220 PRINT" TANK WAS FILLED. MAKE A NOTE OF GALLONS AND COST AND ADD TO":PRINT" N
  EXT FILL-UP."
230 PRINT:INPUT"FILL UP WITH GAS (Y/N)";R$:IF R$="N"THEN 320 ELSE IF R$<>"Y" THE
  N 230
240 X=1:PRINT:INPUT"GALLONS OR LITERS (G/L)";R$:IF R$="G"THEN260 ELSE IF R$<>"L"
  THEN 240
250 INPUT"NUMBER OF LITERS";G:G=G/3.785:PRINT USING "##.###";G;:PRINT" GALLONS":G
  OTO270
260 INPUT"NUMBER OF GALLONS";G
270 IF G>1 AND G<25 THEN 290
280 PRINT:PRINT"PLEASE CONFIRM...";G;"GALLONS";:INPUT R$:IF R$<>"Y"THEN 240
290 INPUT"COST $";C:IF C<0*3 THEN 310
300 PRINT:PRINT"IS THAT CORRECT?";G;"GALLONS COST $";C;:INPUT" (Y/N)";R$:IF R$<>
  "Y"THEN 240
310 C5=C5+C
320 PRINT:INPUT"ADD OIL (Y/N)";R$:IF R$="N"THEN340 ELSE IF R$<>"Y"THEN320
330 Y=1:INPUT"QTS";O:INPUT"COST $";C:C5=C5+C
340 IF X=1 OR Y=1 THEN 350 ELSE 420
350 PRINT:INPUT"MILEAGE WHEN GAS/OIL ADDED";M:GOSUB950:IF F=1 THEN 350 ELSE M=IN
  T(M)
360 IF X<>1 THEN 400 ELSE M2=M-M4:H(I,0)=H(I,0)+G
370 PRINT USING "##.###";M2/G;:PRINT" MILES/PER/GALLON LAST TANK"
380 IF H(I,0)<>G THEN 390 ELSE M6=M5-M4:R=M6/M2:G2=G*R:H(I-1,0)=H(I-1,0)+G2:H(I,
  0)=G-G2
390 M3=M-M5:PRINT USING "##.###";M3/H(I,0);:PRINT" MPG SINCE LAST OIL CHANGE"

```

Break The Software Barrier

Imagine sitting down at your computer system and developing that specialized application you've always dreamed about — with absolutely **no programming!**

Now you can with **PRISM™** — the first Data Base Management System that provides the Total Solution to your information management needs. With **PRISM™** you can have your application up and running in a matter of minutes — not months.

PRISM™
 "The Total Solution" **MAG**

© MAG 1981

PRISM's flexibility and ease of use are combined with its full spectrum of features and capabilities to make it the ideal DBMS for a wide range of business applications. Mailing Lists, Patient Records, Real Estate Listings, and Client Billings are just a few of the possibilities. And **PRISM™** provides the quality, performance, and affordability you have come to expect from MAG software products.

To find out how **your** dreams can become realities, see your **PRISM™** dealer today.

Micro Applications Group, 7300 Caldas Avenue, Van Nuys, California 91406, (213) 881-8076.

PRISM requires CP/M and CBASIC. (CP/M is a registered trademark of Digital Research. CBASIC is a trademark of Complier Systems.)

PROGRAM LISTINGS

```

400 IF Y<>1 THEN 420 ELSE H(I,1)=H(I,1)+O:M3=M-M5
410 PRINT:PRINT USING "#####.##";M3/H(I,1);:PRINT" MILES/PER/QUART SINCE LAST CH
G"
420 IF X=1 OR Y=1 THEN M1=M
430 IF X=1 THEN M4=M
440 IF Y=1 THEN X=1
450 PRINT:INPUT"CHANGE OIL (Y/N)";R$:IF R$<>"Y"THEN 620 ELSE X=1
460 INPUT"MILEAGE ";M:GOSUB950:IF F=1 THEN 460 ELSE M=INT(M)
470 INPUT"TOTAL COST $";C
480 INPUT"DATE MMDDYY ";D:D=INT(D):IF D>10000 AND D<123199 THEN 500
490 PRINT:INPUT DATE USING NUMBERS - MMDDYY, JUL 4 1985 WOULD BE 70485":GOTO480
500 M3=M-M5:C5=C5+C
510 PRINT:PRINT USING "###.##";(M4-M5)/H(I,0);:PRINT" MPG SINCE LAST OIL CHANGE"
520 IF H(I,1)>.5 THEN 530 ELSE PRINT"NO EXTRA OIL USED!":GOTO540
530 PRINT USING "#####.##";M3/H(I,1);:PRINT" MPQ SINCE LAST OIL CHANGE."
540 H(I,2)=M3:I=I+1:H(I,3)=M:H(I,4)=D:M5=M
550 PRINT:PRINT:PRINT"I AM SET UP FOR";M8;"MILES BETWEEN OIL CHANGES OR";INT(D5/
10000);"MONTHS"
560 INPUT" DO YOU WANT TO CHANGE THOSE (Y/N) ";R$:IF R$="N"THEN 590 ELSE IF R$<>
"Y"THEN 560
570 PRINT:INPUT"DESIRED MILES BETWEEN OIL CHANGES";M8:M8=INT(M8)
580 INPUT"DESIRED MONTHS BETWEEN OIL CHANGES";D9:D5=INT(D9*10000):GOTO550
590 PRINT:PRINT"NEXT OIL CHANGE DUE BEFORE:";M+M8;"MILES";:D9=D+D5
600 IF D9>130000 THEN D9=D9-119999
610 PRINT"OR BY ";:GOSUB860:PRINT:GOTO630
620 PRINT:PRINT"OIL CHANGE DUE BY";M5+M8;:D9=H(I,4)+D5:GOTO600
630 PRINT:INPUT"ANY OTHER EXPENSES (Y/N)";R$:IF R$="N" THEN 670 ELSE IF R$<>"Y"
HEN 630
640 X=1:PRINT:INPUT"MILEAGE";M:GOSUB950:IF F=1 THEN 640 ELSE M=INT(M)
650 INPUT"COST $";C:C5=C5+C:IF M>M1 THEN M1=M
660 GOTO630
670 PRINT:H(I,5)=C5/(M1-M9):PRINT"COST/MILE =";:PRINT USING"#####.##";H(I,5)
680 PRINT:INPUT"READY TO CONTINUE";R$:IF X<>1 THEN 730
690 CLS:PRINT"REWIND TAPE TO";T;:INPUT" ...READY";R$:GOSUB900
700 PRINT:INPUT"DO YOU WANT TO MAKE A 'BACKUP' COPY OF THE DATA (Y/N)";R$:IF R$=
"N"THEN720 ELSE IF R$<>"Y"THEN 700
710 PRINT:PRINT"MAKE A NOTE ON THE CASSETTE OF THE COUNTER READING -":INPUT"LIKE
'COPY AT 100'....READY";R$:GOSUB900
720 IF Z=1 THEN 820
730 ON ERROR GOTO840:CLS:INPUT"WANT TO SEE RECORDS (Y/N)";R$:IF R$<>"Y" THEN820
740 CLS:PRINTTAB(25);"CAR HISTORY":PRINT:GOSUB880
750 FOR N=1 TO I:PRINT USING "###";N;:PRINTTAB(6);:PRINTUSING"#####";H(N,3);:
PRINT TAB(18);:D9=H(N,4):GOSUB860
760 G9=0:G1=0:IF H(N,0)=0 THEN 780 ELSE G1=H(N,2)/H(N,0):IF N=I THEN 780
770 IF H(N+1,0)=0 THEN G9=1
780 PRINTTAB(31);:PRINTUSING"#####";H(N,2);:PRINTTAB(43);:PRINTUSING"###.##";G1;
:IF G9=0 THEN 790 ELSE PRINT" *";:G8=1
790 PRINTTAB(53);:PRINTUSING"#####.##";H(N,5):L=L+1:IF L<12 THEN 800 ELSE PRINT
:INPUT"CONTINUE";R$:L=0:PRINT:GOSUB880
800 NEXT N:PRINT:PRINT"(COST/MILE IS CUMULATIVE)":PRINT
810 IF G8=0 THEN 820 ELSE PRINT"* = TENTATIVE FIGURE":PRINT
820 PRINT:PRINT"SEE YOU NEXT TIME":END
830 PRINT:PRINT"SORRY, WE HAVE A PROBLEM. IF YOU HAVE ENTERED ANY INFORMATION,";
PRINT"IT HAS NOT BEEN SAVED.":END
840 PRINT:PRINT"SORRY, WE HAVE A PROBLEM. ANY DATA YOU ENTERED HAS BEEN SAVED"
850 PRINT"BUT I'M HAVING TROUBLE WITH A CALCULATION.":END
860 D1=INT(D9/10000):D2=INT((D9-D1*10000)/100):D3=INT(D9-(D1*10000+D2*100))
870 PRINT USING "###";D1;:PRINT"/";:PRINT USING "###";D2;:PRINT"/";:PRINT USING "##
#";D3;:RETURN
880 PRINT"CYCLE";TAB(7);"SRT MILE";TAB(18);"SRT DATE";TAB(29);
890 PRINT"TOT MILES";TAB(44);"MPG";TAB(55);"COST/MILE":RETURN
900 PRINT:PRINT"PUSH 'RECORD' AND 'PLAY' ON TAPE RECORDER";
910 POKE15566,131:POKE15567,131:POKE 15568,131:INPUT"....READY";R$
920 PRINT#-1,M9,D5,M1,M4,M5,M8,C5,I
930 FOR N=1 TO I:PRINT#-1,H(N,0),H(N,1),H(N,2),H(N,3),H(N,4),H(N,5):NEXT N
940 PRINT:INPUT"PUSH 'STOP'....READY";R$:RETURN
950 F=0:IF M>M1 THEN RETURN
960 PRINT:PRINT"BUT THAT'S A LOWER READING THAN THE LAST ONE YOU ENTERED?":F=1:
RETURN

```

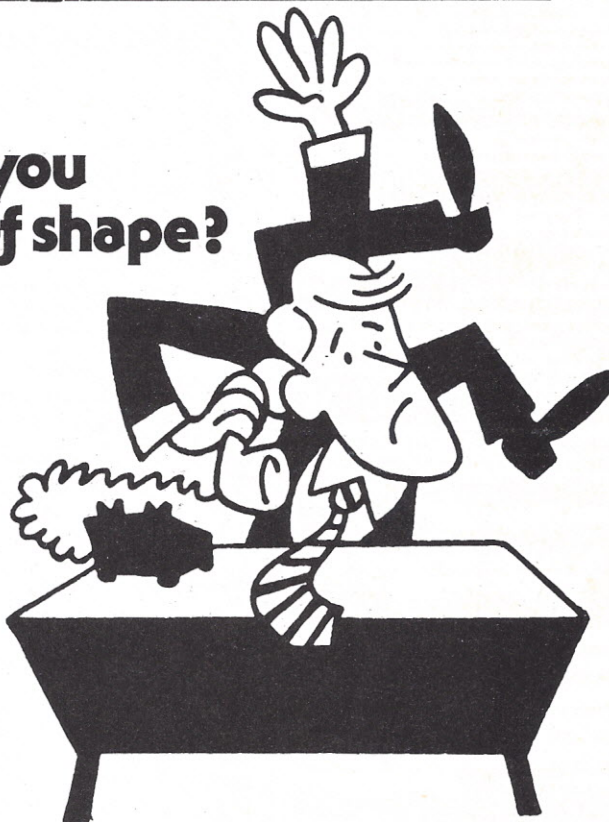


micro lab presents a

TAXSAVER



**New Tax Laws have you
bent out of shape?**



Get straightened out fast with the ASSET-MANAGER.

The new tax laws change the way individuals, companies, and partnerships depreciate assets. In some cases you should file using the old methods; in others, the new law applies; you may require a combination of the old and new laws; or you may even have to refile.

The Asset-Manager takes the confusion out of the laws. It took two college professors to untangle the mess for you. Because the authors of this remarkably easy program are also teaching, they know how to simplify the

problems you will encounter. Just enter your assets and the program selects the correct methods of depreciation, prints the schedules for your taxes, and even produces reports for your financial statement. It uses the accelerated method for your taxes and the straight line method for your financial statement. All this and year-round asset management too.

Available at your Apple dealer at the introductory price of \$200.

Apple is a trademark of Apple Computers, Inc.



2310 Skokie Valley Road
Highland Park, IL 60035 • 312-433-7550

© 1981, Micro Lab, Inc.

CIRCLE 95

ATTENTION!

February begins a new national monthly publication, CompuKids, specifically designed for computer enthusiasts ages 7-17. Every issue will be packed full of educational computer games, programming hints, motivational articles, cartoons, and advertising.

We can use your help to insure that this badly needed publication is a success. Please forward appropriate articles, original programs, related cartoons and jokes to our Editorial staff (Dept. E) for selection. Interested advertisers and dealers, please contact our Advertising and Marketing Department (Dept. A).

A special 12-month introductory subscription is now being offered at \$12, a savings of over \$10 of the planned newsstand price of \$1.95 per issue.

To subscribe, mail \$12 check or money order to: Barreto and Associates, Incorporated, Department S, Box 975, Sedalia, MO 65301 or phone (816) 826-0689

For extra prizes, games, contests information throughout the year, and a complementary subscription to CompuKids, join the CompuKids Computer Club. Annual dues are \$20. Mail today to Department C of the above address.

CIRCLE 96

Epson® MX 100 & MX70/MX80 Replacement Cartridge Ribbons



Introducing the Epson® MX100 Nylon replacement ribbon cartridge manufactured completely by Aspen Ribbons, Inc., offered in addition to our Epson® MX70/MX80 ribbon. Both of these products are 100% compatible with the original.

Prices are lower than those of the original equipment manufacturer. We encourage all retail, OEM, and wholesale inquiries. Remember, all of our ribbon products are recyclable.

Aspen Ribbons, Inc. • 1700 N. 55th Street
Boulder, Colorado USA 80301-2796
(303)444-4054 • Toll Free 1-800-525-0646
Telex 45-0055

CIRCLE 97



NEW! for
the '89 from

**MAGNOLIA
MICROSYSTEMS**

DOUBLE DENSITY DISK CONTROLLER

for both 5 1/4" & 8" drives

only **\$595** complete

including CP/M™2.2

MAGNOLIA MICROSYSTEMS, INC.
2812 Thornhyke W., Seattle 98199
(206) 285-7266 (800) 426-2841

CP/M is a trademark of Digital Research.

CIRCLE 98

EDUCATIONAL SOFTWARE

For TRS-80, Pet, Apple
& Color Computer

ELEMENTARY	MATH
SCIENCE	HISTORY
GEOGRAPHY	ACCOUNTING
ECONOMICS	BUSINESS ED.
FOREIGN LANG.	FARM RECORDS
GRAMMAR	COIN INVENTORY

Write for FREE Catalogue!

MICRO LEARNINGWARE, Box 2134, N. Man-
kato, MN 56001 (507) 625-2205

VISA & MASTER CARD ACCEPTED

We pay 15% royalty for Educational Programs
listed with us

TRS-80 is a registered Trademark of TANDY
CORP. Pet is a trademark of Commodore Bus
Machines. Apple is a trademark of Apple Com-
puter Co.

CIRCLE 99

for POCKET COMPUTERS BEGINNER'S GUIDE TO PROGRAMMING

Master your Sharp/Radio Shack
computer in just hours!

- Understand every step.
- Write programs immediately.
- Everyone succeeds.

\$19 postpaid. Remit in U.S. Funds.
Add \$3 if outside U.S. California residents add 6% Sales Tax

**SHARP PC PRODUCTS
and GE CASSETTE PLAYER**
Write for our Special Offer!

FREE

- Copy of COMPUNOTES, the news-
letter for PC users with useful pro-
grams, fully explained.
- Directory of products & services.

XCEL 13763 Polk Street, #3B
Sylmar, California 91342
(213) 367-4366

CIRCLE 101

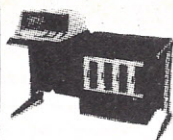
Educational Software for the ATARI*

Tutorials
Self-Paced Programs
Puzzles
Games
Drill & Practice

Write for Free Flyer



CIRCLE 102



DATAPoint 1134 Diskette Systems

16k Processor with Four Diskettes
(1 Megabyte). 80 CPS Matrix
Printer. Nationwide maintenance
available.

\$2,150

SOFTWARE AVAILABLE
DISK OPERATING SYSTEM
SORT UTILITY
ISAM UTILITY

ALSO AVAILABLE FOR \$100 EACH:
A/P, A/R, GENERAL LEDGER, PAYROLL, TIME
ACCOUNTING, AND INVENTORY

AMERICAN COMPUTER EXCHANGE

100 N. MAIN ST. BOX 52
CHAGRIN FALLS, OH 44022
216-247-2100

CIRCLE 103

A small business needs a word processing system with a small price tag.

Owning a small office computer can make sense by
saving time. But its software system should make sense
too—it should be inexpensive, easy to use, perform routine
office chores. It should be Kwikrite.

Kwikrite consists of an instruction manual and 5 1/4"
floppy disk, programmed for TRS-80 Model I and Model
III, but it is adaptable to most small computers. It will write
form letters with customized inside addresses and saluta-
tions; print out continuous labels; write standardized
report pages (manuals, manuscripts, etc.); and create title
pages for those reports, properly centered and spaced.

Kwikrite is so easy to use that you can begin operation
immediately. And it is so inexpensive, it will quickly pay
for itself.

So send today for Kwikrite, the system that makes sense.

The Kwikrite program requires 16K (1) disk, written in BASIC, source
code is easily modified for tape. It costs \$37.50 plus \$2.00 for shipping.
MasterCard or VISA accepted. Catalogue of other software available free.
Send order to: M. B. Rowe & Associates;
Suite 1, Southgate Office Bldg.; 716 Fourth
Street S.W.; Hickory, North Carolina 28601;
704-328-2386.

**kwikrite
\$3750**

CIRCLE 104

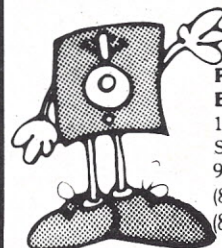
MEMOREX FLEXIBLE DISCS

**WE WILL NOT BE UNDER-
SOLD!!** Call Free (800)235-4137
for prices and information. Dealer
inquiries invited and C.O.D.'s
accepted.



**PACIFIC
EXCHANGES**

100 Foothill Blvd.
San Luis Obispo, CA
93401. In Cal. call
(800)592-5935 or
(805)543-1037



CIRCLE 100

BEGIN WITH THE BEST ... HAYDEN TEXTS!



BASIC FROM THE GROUND UP (Simon) A BASIC text for high school students and hobbyists that explores computers and the BASIC language without relying on heavy mathematical background on the readers' part. Includes all features of BASIC, as well as some of the inside workings of a computer. Includes exercises and six worked out problems. Glossary and summary of BASIC statements. #5760-1, \$11.75

BASIC BASIC: An Introduction to Computer Programming in BASIC Language, 2nd Edition (Coan) "... an excellent introduction to the use of BASIC... clearly written and well-organized." Computing Reviews. Over 100 sample programs to present the essential statements of BASIC. Each new language statement or capability is clearly explained at the time that it is first used in a sample program. Practice problems follow every section. Even-numbered solutions appear in the text, the remainder in the Teacher's Guide. #5106-9, paper, \$11.50; #5107-7, cloth, \$15.25; #5108-5, Teacher's Guide, \$1.40

BASIC FORTRAN (Coan) Enables you to write meaningful FORTRAN programs for your micro. Over 80 program examples are included. #5868-9, \$9.95

PROGRAMS FOR BEGINNERS ON THE TRS-80 (Blechnan) A valuable book of practical and interesting programs for home use that can be understood and used immediately by the beginner in personal computer programming. Learn step-by-step how 21 sample programs work. Techniques are described line-by-line within the programs, and a unique Matri-Dex™ matrix index will enable you to locate other programs using the same BASIC commands and statements. Each program has a detailed description, complete listing, explanation of what the program does, and instructions for modification. #5182-4, \$8.95

WEBSTER'S MICROCOMPUTER BUYER'S GUIDE (Webster) A detailed reference guide useful to both first time and experienced users. It provides extensive information on the wide variety of microcomputer systems and suppliers, including new Japanese products. Each microcomputer system description includes a brief overview, central processing systems, peripherals, software, pricing and main office. Business, educational and professional applications of microcomputer systems are detailed. #5129-8, \$25.00

SPEAKING PASCAL (Bowen) An excellent introduction to programming in the PASCAL language, written in clear, non-mathematical language and requiring no technical background or previous programming experience on the reader's part. Begins with the structure of computers and the problems of programming languages and then goes on to discuss various components of PASCAL. Programs developed using structured programming techniques. Illustrated, exercises, and examples. #5164-6, \$11.95

ORDER NOW!

Hayden Book Co., Inc.
50 Essex St., Rochelle Park, NJ 07662

Please send me the book(s) checked on 15-day FREE examination. At the end of that time, I will send payment, plus postage and handling, or return the book(s) and owe nothing. On all prepaid, Visa or Master Card orders, publisher pays postage and handling — same return guarantee. Residents of NJ and CA must add sales tax. Payment must accompany orders from PO Box numbers. Name of individual ordering must be filled in. Prices subject to change without notice.

- | | | | |
|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| ☐ 5106-9 | ☐ 5760-1 | ☐ 6164-1 | ☐ 6175-7 |
| ☐ 5107-7 | ☐ 6154-4 | ☐ 6165-X | ☐ 6176-5 |
| ☐ 5108-5 | ☐ 6155-6 | ☐ 6166-8 | ☐ 6184-6 |
| ☐ 5129-8 | ☐ 6156-0 | ☐ 6174-9 | ☐ 6185-4 |
| | | | ☐ 6186-2 |

Name _____

Address _____

City/State/Zip _____

PC 1-82-004

Available at your local computer store!

For Orders, Inquiries and Technical Support Call Toll Free

HAYDEN HOTLINE
800-631-0856

50 Essex Street, Rochelle Park, NJ 07662

Hayden
Book Company, Inc.

CIRCLE 106

PERSONAL COMPUTING DEALERS

Many of the products and services listed in *Personal Computing* are available from the dealers listed here. This listing is in alphabetical order for easy reference.

ALASKA

Computerland (907) 272-1518
TV Mart Sales and Service (907) 277-2142

ALABAMA

Anderson Computers (205) 539-3444
Computerland (205) 344-4401
Olensky Brothers (205) 344-7448
University Supply Store (205) 348-6168

ARKANSAS

Computerland/Little Rock (501) 224-4508

ARIZONA

Computerland/Phoenix (602) 956-5727
Computerland/Tempe Mesa (602) 962-6732
Computerland/Tucson (602) 297-7023
The Computer Store (602) 866-0258
Dataplace (602) 266-6111
Desert News (602) 747-0428
Food for Thought (602) 327-9481
Heathkit Electric Center (602) 279-6247
Metro Computer Store (602) 323-3116
Micro Age Computer Store (602) 941-8794
Micro Age Computer Store (602) 790-8959
Personal Computer Place (602) 833-8949

CALIFORNIA

Advanced Computer Prods. (408) 946-7010
Advanced Computer Prods. (714) 558-8813
Apple of Orange (714) 974-3082
A-Vidd Electrs. Co. (213) 598-0444
Berkeley Computer (415) 526-5600
Byte Shop (714) 565-8008
Byte Shop (805) 647-8945
Byte Shop No. 1 (415) 969-5464
Byte Shop/Placentia (714) 524-5380
Byte Shop/Sacramento (916) 961-2983
Central Campbell Computers (408) 370-0199
Computer Age (408) 476-6170
Computer Age (714) 565-4042
Computer Center (415) 845-6366
Computer City (714) 549-7749
Computer Components (213) 786-7411
Computer Forum (213) 921-2111
Computerland (213) 371-4624
Computerland (714) 464-5656
Computerland (714) 560-9912
Computerland (805) 928-1919
Computerland (415) 794-9311
Computerland (408) 246-4500
Computerland (408) 267-2182
Computerland (408) 253-8080
Computerland/El Cerrito (415) 527-8844
Computerland/Los Altos (415) 941-8154
Computerland/Pasadena (213) 449-3205
Computerland/Sacramento (916) 920-8981
Computerland/San Bernardino (714) 886-6838
Computerland/San Fernando (213) 716-7714
Computerland/San Francisco (415) 546-1592
Computerland/Walnut Creek (415) 935-6502
Computerland/W. Los Angeles (714) 560-9912
Computer Merchant (714) 583-3963
Computer Merchant (714) 583-3963
Computer Metrics (714) 579-8066
Computer Place (408) 624-7111
Computer Plaza (805) 687-9391
Computer Plus (805) 963-4542
Computer Plus (408) 735-1199
Computer Post (714) 695-2000
Computer Post (408) 244-5300
Computer Post (415) 790-0410
Computers are Fun (213) 475-5476
Computer Scene (707) 462-1578
Computer Shop (805) 963-1325
Computer Sound (805) 945-5921
Computers To-Go (805) 496-2868
Computer Store (213) 451-0713
Computer Store Chula Vista (714) 281-0285
Computer Store/San Leandro (415) 569-4174
Computer World (714) 891-2584
Consumer Computers (714) 465-8888
CTC-The Computer People (714) 565-0505
Dimensional Software (714) 275-4243
Dow Radio (213) 793-1195
Dow Radio (805) 486-6353
Electric Brain (209) 227-8479
Harding Way News (209) 464-7514
Heathkit Electro Center (213) 749-0261
Heathkit Electro Center (714) 776-9420
Heathkit Electro Center (408) 377-8920
Heathkit Electrs. (415) 236-8870
Henry Radio (213) 820-1234
James Games Computer Center (714) 985-3278
Keplers' Books (415) 948-5666
Leavitt Distributors (213) 982-2514
Malibu Micro Computing (213) 456-1137
Marin Computer Center (415) 472-2650
Marvac Electrs. (714) 540-3280
Micro Age Computer Store (415) 786-5264
Micro Age Computer Store (415) 964-7063

Micro Business World (213) 370-4842
Micro Pacific Computer Ctr. (209) 229-0101
Net Profit Computers (714) 750-7318
O Pamp Technical Books (213) 464-4322
Opsbl Personal Electr. (805) 967-7100
P C Computers (415) 527-6657
Peninsula Computer Ctr. (408) 758-9840

Pomona Valley News Agency (714) 591-3885
Poor Richard's Almanac (408) 425-1991
Printers (415) 327-6500
Quement Electrs. (408) 998-5900
Rainbow Computing (213) 349-5560
Santa Rosa Computer Ctr. (707) 528-6480
Software Store (213) 473-1136
Stacey's Bookstore (415) 421-4687
Sunset Computers (415) 665-7378
Systems Formulate (415) 281-2621
Technika Berkeley (415) 524-8934
Wenger Computers (707) 445-9239
Zackit Electrs. (916) 446-3131
Zackit Monterey (408) 375-3144
Zackit Vallejo (707) 644-6676
3 E Software Systems (415) 537-3637

COLORADO

Aparat (303) 741-1778
Colorado Computer Sys. (303) 426-5880
Computer Connection (303) 449-8282
Computer Connection (303) 449-8282
Computerland (303) 574-4170
Computerland/Denver (303) 759-4685
Computer Technology (303) 427-4438
Computer Works (303) 449-6233
Micro Computer Mgmt. (303) 493-5700

CONNECTICUT

AM Computer Prods. (203) 621-2331
Aetna Life Club Store (203) 273-3058
Byte Me Computer Shop (203) 444-1188
Computer City (203) 521-2245
Computerland/New Haven (203) 273-4807
Computer Store (203) 563-9000
Computer Store (203) 356-1920
Computer Store (203) 627-0188
Computer Works (203) 255-9096
Diversified Electrs. (203) 397-2607
Harold's Drugs (203) 583-1854
Micro Age Computer Ctr. (203) 846-0851
Technology Sys. (203) 748-6856

DELAWARE

Computerland (304) 624-6409
Computerland/New Castle (302) 738-9656
Micro Age Computer Store (302) 998-7340

DISTRICT OF COLUMBIA

Computer Store (202) 272-0294
Pentagon Book Stores (202) 695-0870
Program Store (202) 337-4693
Students Book Co. (202) 223-3327

FLORIDA

A I Personal Computer (305) 339-8914
Byte Shop of Miami (305) 264-2983
Clarks Out of Town News (305) 467-1543
Computer Ctr./Palm Beaches (305) 689-3233
Computerland (305) 862-6202
Computerland (904) 224-9341
Computerland (813) 971-1680
Computerland/Boca Raton (305) 368-1122
Computerland/Ft. Lauderdale (305) 566-0776
Computerland/W. Palm Beach (305) 684-3338
Computer Scene (305) 945-1014
Computer Shack (904) 396-1800
Computer Store/Gulf Breeze (904) 932-0660
Computer Sys. Resource (904) 376-4276
Data Processing Computer Store (305) 894-8351
Electronic Equipment Co. (305) 871-3500
Goerlings Book Ctr. (904) 378-0363
Grice Electrs. Inc. (904) 477-8100
Heathkit Electr. Ctr. (305) 823-2280
Heathkit Electrs. Ctr. (813) 886-2541
Henry's News Stand (813) 536-3863
H.I.S. Computerization (305) 254-9399
Lighthouse Book Store (305) 781-1945
Micro Computer System Inc. (813) 879-4301
Poling Place (813) 541-2729
West Indies Electr. (305) 556-1300
Williams Radio and TV (904) 354-5460

GEORGIA

Atlanta Computer Mart (404) 455-0647
Baileys Computer Shop (404) 790-5771
Computerland/Atlanta (404) 953-0406
Electronics 21 Inc. (912) 352-0585
Guild News Agency (404) 252-4166

HAWAII

Amtec Inc. (808) 955-7429
Computer Center (808) 448-2171
Computerland/Hawaii (808) 521-8002
Data 1 Microcomputer (808) 946-1733
Radio Shack No. 7086 (808) 487-1509
Univ. of Hawaii Bookstore (808) 948-8022

IOWA

Business Data Processing (515) 276-8858
Memory Bank (319) 386-3330

IDAHO

Computer Co. Inc. (208) 375-9381
Northwest Computer Ctr. (208) 375-6681

ILLINOIS

ABC Byte Shop (312) 673-3550

ALPINE COMPUTER CTR.

Book Market (815) 229-0200
Book Market (312) 944-3358
Byte Shop (312) 440-4475
Byte Shop (312) 579-0920
Chicago Main Newstand (217) 352-2323
Compshop (312) 864-2727
Computerland (312) 593-1800
Computerland (312) 949-1300
Computerland (312) 967-1714
Computerland/Champaign (217) 359-0895
Computerland/Northbrook (312) 272-4703
Computerland/Schaumburg (312) 253-3009
Computer Store/Rockford (815) 962-7580
Data Domain/Schaumburg (312) 397-8700
Digitalworld (312) 628-9222
Kroch's & Brentano's (312) 332-7500
Micro Computer Ctr./Geneva (312) 232-1545
Midwest Micro Computers (312) 495-8889
Northbrook Computers (312) 480-9190
Oak Brook Computer Ctr. (312) 941-9005
Prairie News Agency (312) 883-1141
The Book Store (312) 255-8040
Tri-State Electr. Corp. (312) 255-0600
Univ. Bookstore (618) 536-3321
Videomart Inc. (312) 861-1255
Wallace Micro-Mart Inc. (309) 685-7876
Wine Micro Computers (312) 420-8813

INDIANA

Acro Electronics (219) 397-8681
Computerland (219) 256-5688
Computerland (219) 483-8107
Computer Plus (219) 865-3930
Computer Room (219) 277-1515
Computer Store (717) 662-9994
Data Base (219) 484-3164
Data Domain (812) 334-3607
Graham Electrs. (717) 634-8202
Heathkit Electr. Ctrs. (317) 257-4321
Hoosier Electrs. (812) 232-8508

KANSAS

Amateur Radio Equip. (316) 264-9166
Book Nook (913) no listing
Computerland (913) 492-8882
Computerland Hutchinson (316) 662-6832
Computerland/Topeka (913) 267-6530
High Technology/Wichita (316) 262-0315
Micro Age Computer Store (913) 823-7596
Online Computer Centers (913) 341-6651
Personal Computer Ctr. (913) 649-5942

KENTUCKY

Computer Emporium (502) 589-9482
Computer Place (606) 276-3594
Heathkit Electr. (502) 245-7811

LOUISIANA

Computer Shoppe Inc. (504) 454-6600
Radio Shack (318) 436-6720

MASSACHUSETTS

Compumart (617) 491-2700
Computer City (617) 755-5464
Computer City (617) 875-8126
Computer City (617) 273-3146
Computer City (617) 242-3250
Computer City (617) 626-9217
Computerland/Boston (617) 235-6652
Computerland/Boston (617) 482-6033
Computer Source (413) 443-7181
Computer Store (617) 232-5470
Computer Store (617) 354-4599
Heathkit (617) 511-9332
Heathkit Electrs. (617) 237-1510
Out of Town News (617) 354-7777
Palace Spa (617) 783-5858
Retail Computer Ctr. (413) 589-0106
Small Business Group (617) 692-3800
YDI Electrs. (617) 449-1005

MAINE

Home Port Computers (207) 873-2192

MARYLAND

Bethesda Computers (301) 657-1992
Chafitz (301) 340-3300
Computer Crossroads (301) 730-5513
Computers Etc. (301) 268-5801
Computers Etc. (301) 268-5801
Computers Etc. (301) 296-0520
Computerland (301) 340-8484
Computerland/Towson (301) 337-5555
Computer Unlimited (301) 321-1553
Heathkit Electrs. (301) 881-5420
Logical Choice (301) 465-3175
Micro Age (301) 762-7585
Muse Computer Ctr. (301) 659-7212
Program Store/Baltimore (301) 944-0200
Radio Shack (301) 224-2900
The Comm. Center (301) 792-0600

MICHIGAN

Community News (517) 321-8797
Community News Center (313) 662-6150
Community Newscenter (517) 694-0490
Community Newscenter (517) 349-3510
Computer Center (313) 422-2570
Computer Connection (313) 447-4470
Computer Land/Grand Rapids (616) 942-9231
Computerland/Southfield (313) 356-8111
Computer Mart (313) 288-0040
Computer Mart/Flint (313) 234-0161
Computer Mart/Lansing (517) 351-1777

Front Page Bookstore	(313) 332-3431	Computer Store	(914) 428-1661	City Electr. Supply	(713) 621-1060
Heathkit Electr.	(313) 772-0416	Computer Store-Rochester	(716) 244-5000	Compushop	(214) 234-3412
Heathkit Electr. Ctr.	(313) 535-6480	Computer Tree	(607) 748-1223	Compushop	(713) 893-2060
Level 4 Products	(313) 525-6200	Comtek/Brooklyn	(212) 332-5933	Computer Center/Houston	(713) 527-8008
Metro News 1	(313) 759-0230	Comtek/Staten Island	(212) 698-7050	Computercraft	(713) 977-0664
Micro Computer World	(616) 451-8348	Datel Sys.	(212) 921-0110	Computerland	(214) 363-2223
NCE/Compumart	(617) 491-2700	Future Distribution	(518) 561-5703	Computerland/Austin	(512) 452-5701
New Horizons Book Shop	(313) 296-1560	Future Visions Computer	(516) 423-7820	Computerland/EI Paso	(915) 533-6060
New Dimensions in Computing	(517) 337-2880	Harcourt Brace Bookstore	(516) 293-7990	Computerland/Houston Bay	(713) 488-8153
Rainbow Computing	(313) 528-3535	Heathkit	(914) 761-7690	Computerland/Tyler	(214) 581-7000
Rochester Book Center	(313) 651-0199	Heathkit Electrs.	(516) 334-8181	Computerland/Westwood	(713) 270-1200
Simtec	(313) 855-3990	Heathkit Electrs.	(716) 835-3090	Computer 'N' Things	(512) 453-5970
Spectrum Computers	(313) 559-5252	Home Computer Ctr.	(716) 244-6237	Computer Port	(817) 469-1502
MINNESOTA		L.I. Computer Store	(516) 887-1500	Computer Pro	(817) 654-3360
ABS Computer	(612) 253-8734	Magazine Emporium	(212) 864-0500	Computer Shop	(512) 828-0553
Compudata	(218) 722-6319	Majority New Dist.	(212) 243-7770	Computer Solutions	(512) 341-8851
Computer Depot	(612) 375-2008	Micro Age Computer Store	(716) 244-9000	Computer Tech Assoc.	(915) 533-2108
Computerland	(612) 933-8841	Mr. Computer	(914) 297-1223	Computer Technique	(713) 947-9633
Computerland	(612) 933-8841	Papyrus Books	(212) 864-8862	Computer To-Go	(512) 472-8926
Computerland	(612) 333-3151	Programs Unlimited	(516) 997-8668	Computer Video Sys.	(214) 423-3654
Digital Den	(612) 699-8442	Programs Unlimited	(914) 761-9283	Expensive Toys/Big Boys	(512) 340-5600
Granada News	(218) 727-9122	Spartan Electrs.	(516) 499-9500	Hartwells Office World	(713) 777-2673
Heathkit Ctr.	(612) 938-6371	Super Business Machines	(212) 964-6666	Heathkit	(512) 341-8876
Lim Computers	(612) 560-0336	Syosset Video & Electrs.	(516) 921-5454	Heathkit Electrs. Ctr.	(214) 826-4053
Micro Age Computer Store	(612) 338-1777	OHIO		KA Electr. Sales	(512) 458-2257
Minnesota Book Center	(612) 373-5734	All Media Material	(216) 678-5499	Lone Star News	(713) 772-9007
Readmore Bookstore	(612) 333-3628	American Bookstore, New Parma	(216) 888-8210	Micro Age Computer Store	(602) 894-9247
Readmore Book & Card	(507) 345-5704	Basic Computer Shop	(216) 867-0808	Micro Age Computer Store	(915) 544-7145
Schindler's Hennepin News	(612) 333-6942	Cincinnati Computer Store	(513) 671-6440	Micro Age Computer Store	(713) 270-9647
MISSOURI		Computer Connection	(419) 222-6464	Micro Computer Shoppe	(512) 855-4516
Computer Country-North	(314) 921-5644	Computer Corner	(216) 473-5010	Northwest Newstand	(713) 681-7310
Computer Mart/Springfield	(417) 862-6500	Computerland/Akron-Canton	(216) 493-7786	Percom	(214) 272-3421
Computervan Software Ctr.	(314) 838-7755	Computerland/Cleveland	(216) 461-1200	Software & Peripherals Ltd.	(817) 566-3888
Gateway Electrs	(314) 427-6116	Computerland/Warren	(216) 544-4191	Waco Comm.	(817) 772-8550
House of Computers	(417) 782-0880	Cosmic Comics	(216) 784-3449	Waghalter Books	(713) 627-9970
MONTANA		Hudson Computer	(216) 653-9010	Westheimer Newstand	(713) 781-7793
Prairie Computers	(406) 727-6992	Leo's Book & Wine Shop	(419) 255-5506	UTAH	
NORTH CAROLINA		Micro Age Computer Store	(614) 868-1550	Central Utah Electrs.	(801) 373-7522
Byte Shop	(704) 568-8100	Micro Center	(614) 486-5381	VIRGINIA	
Computer Alternatives	(704) 274-5404	Micro Computer Ctr.	(513) 435-9355	Arcade Electrs.	(703) 256-4610
Computerroom	(704) 377-9821	News Depot	(216) 454-4444	Arlington Electric Wholesale	(703) 524-2412
K & S Newstand	(919) 724-7537	News - Readers	(513) 879-4444	Computerland/Richmond	(804) 741-3536
Liberty News & Beverage	(919) 493-1180	Personal Computers	(614) 475-2007	Computerland/Tyson's Corner	(703) 893-0424
Worldwide News & Specialties	(919) 467-7130	Newstand	(216) 235-9321	Computer Place	(703) 982-3661
NORTH DAKOTA		Wilkie News	(513) 223-2541	Computers Plus	(703) 971-1996
Computerland/Fargo	(701) 237-3069	21st Century	(513) 651-2111	Computer Store	(617) 272-0294
Computerland/Grand Forks	(701) 746-0491	OKLAHOMA		H.B. Computer Ctr.	(703) 295-1975
NEBRASKA		Book Shack	(405) 233-1588	Heathkit Electrs.	(703) 765-5515
Abacus	(402) 345-6020	Computerland/Oklahoma	(405) 755-5200	Home Computer Ctr.	(804) 340-1977
Micro Age Computer Store	(402) 564-7213	Computerland/Tulsa	(918) 481-0332	Home Computer Ctr.	(703) 595-1955
Computerland/Lincoln	(402) 391-6716	Computer Service Unlimited	(405) 329-2154	Program Store	(703) 536-5404
Computerland/Omaha	(402) 391-6716	Computer Store	(918) 224-5347	Virginia Micro Sys.	(703) 491-6502
NEW HAMPSHIRE		Employee's Assoc. Bookstore	(405) 686-4295	V.P.I. Facilities	(703) 961-5991
Bitznoyts	(603) 224-8233	High Technology Detail	(405) 528-8008	WASHINGTON	
Computer City	(603) 898-2390	Micro Age Computer	(405) 728-1837	A B C Comm.	(206) 364-8300
Computer City	(603) 668-9527	OREGON		Alpha Computer Sys.	(509) 586-7603
Computerland/Nashua	(603) 889-5238	Byte Shop	(503) 641-8581	Amateur Radio Supply Co.	(206) 767-3222
Computer Mart/New Hampshire	(603) 883-2386	Computerland/Portland	(503) 620-6170	Byte Shop	(206) 622-7196
Computer Town	(603) 893-8812	Computer Solutions	(503) 689-9677	Central Computers	(206) 746-5227
Silent Partner	(201) 947-9400	Computer Specialties	(503) 399-0534	City News	(206) 455-9683
NEW JERSEY		Computer Store Corvallis	(503) 754-0811	Computerland	(206) 581-0388
Computer Corner/New Jersey	(201) 835-7080	C 2 E	(503) 754-0811	Computer & Video Ctr.	(206) 695-1540
Computer Encounter	(609) 924-8757	Fifth Avenue News	(503) 222-7462	Data-Borne Computers	(206) 248-0101
Computer Forum	(201) 530-9103	Micro Age Computer Store	(503) 256-4713	Empire Electrs.	(206) 244-5200
Computerland	(201) 845-9303	New Day Computing	(503) 223-8033	Heathkit	(206) 682-2172
Computerland/Cherry Hill	(609) 795-5900	Norvac Electrs.	(503) 644-1025	Heathkit	(206) 246-5357
Computerland/Morristown	(201) 539-4077	Rich Cigar Store	(503) 228-1700	Personal Computers	(509) 534-3955
Computer Nook	(201) 575-9468	PENNSYLVANIA		Rob Roy Computer Shop	(509) 575-7704
Computer Universe	(201) 262-0960	A & B Computers	(717) 822-7727	Western Micro Computer Ctr.	(206) 676-9558
Computer Workshop	(609) 429-5703	Computer Forum	(215) 296-3474	WISCONSIN	
Comtek	(201) 472-2440	Computer House	(412) 921-1333	American Computer Sys.	(608) 257-1348
Earth Rise Micro Sys.	(201) 791-6935	Computerland/Dressler	(215) 542-8835	Byte Shop/Milwaukee	(414) 281-7004
Heathkit Electr. Ctr.	(201) 647-3900	Computerland/Harrisburg	(814) 533-6892	Century Computer	(608) 788-2350
Micro Computer Services	(609) 927-3880	Computerland/Lehigh Valley	(215) 776-0202	Chester Electr. Supply	(414) 658-4616
Personal Computing	(201) 244-7494	Computerland/Paoli	(215) 296-0210	Computerland/Fox River	(414) 233-1808
Radio Shack	(609) 234-2666	Computer Store	(717) 272-0294	Computerland/LaCrosse	(608) 781-2090
Radio Shack	(201) 342-8788	Computer Store	(215) 322-5947	Computerland/Madison	(608) 273-2020
Software City	(201) 342-8788	Computer Workshope	(412) 823-6722	Computerworld	(414) 733-9547
Stoneledge Computer	(201) 277-1020	Drexel University Book Store	(215) 895-2000	Four J's	(414) 466-8990
NEW MEXICO		Erie Computer Co.	(412) 454-7652	WEST VIRGINIA	
Computer Tech Assoc.	(915) 533-2108	Heathkit Electr. Ctr.	(215) 288-0180	Computerland/Parkersburg	(304) 485-6823
Electronic Parts Co.	(505) 293-6161	Heathkit Electr. Ctr.	(215) 647-5555	Computer Store	(304) 345-1360
Micro Waves Computer Store	(505) 883-0955	Marketline Sys.	(215) 947-6670	Nicks News	(304) 697-2459
NEVADA		Mighty Byte Computer Ctr.	(215) 443-9020	WYOMING	
Century 23	(702) 870-1534	Pittsburgh Computer Store	(412) 341-6301	Computerland/Casper	(307) 234-2879
Computer Store	(702) 826-5055	20 20 Computers	(215) 439-1800	CANADA	
Home Computers	(702) 736-6363	RHODE ISLAND		Computer Circuit	(510) 672-9370
PCS Computer Service	(702) 870-4138	Computer City	(401) 331-2187	Computer World	(604) 732-1485
NEW YORK		Computer Store	(401) 272-8770	Conte Electrs.	(604) 324-0505
Adirondack Electrs.	(518) 346-4717	Heathkit Electr. Ctr.	(401) 738-5150	Galatica Computers	(403) 424-7007
Berliner Computer Ctr.	(516) 775-4700	SOUTH CAROLINA		House of Computers	(416) 482-4336
Byte Shop East	(212) 889-4204	Datamart/S. Carolina	(803) 233-5753	Micron Dist.	(416) 361-0609
Castle Computers	(518) 783-9405	Computerland/Rapid City	(605) 348-5384	Minitronics	(604) 872-3225
Computer Center	(212) 889-8130	SOUTH DAKOTA			
Computer Corner	(914) 949-3282	Computerland/Memphis	(615) 892-7038		
Computer Era	(212) 860-0500	Eastern Micro Computer	(901) 761-4743		
Computers Etc.	(315) 446-6502	Tobacco Corner	(615) 594-8365		
Computerland	(212) 840-3223	TEXAS	(901) 682-3326		
Computerland/Buffalo	(716) 836-6511	Agriplex Computers	(806) 797-4495		
Computerland/Ithaca	(607) 277-4888	Axiom Business Computers	(214) 279-1505		
Computerland/Massina	(315) 769-9971	Centurion Computers	(817) 778-9105		
Computerland/Nassau County	(516) 742-2262				
Computer Microsystems	(516) 627-3640				
Computer Room	(518) 869-3818				
Computer Shoppe	(516) 758-6558				
Computer Store	(212) 832-2180				

NEXT IN PERSONAL COMPUTING

Purchasing with
personal computing

Personal computing
controls costs

Presentations made
easier with personal
computing

Feature report:
mass-storage
systems

PERSONAL COMPUTING

Sales Administrator
Joy Nichols

Sales Coordinator
Anne Lacitignola

Associate Publisher
Jeff Weiner

District Managers
Bill Knickel (408) 736-6667
Andy Meehan (201) 843-0550
Robert Pavone (201) 843-0550
Dee Quinn (408) 736-6667
Michael Reynolds (213) 641-6544
Arlene Schulman (201) 843-0550

Japan
Haruki Hirayama 402-4556

Publisher
Robert J. Lydon

PLANETARY MOTION

Watch the planets as they revolve around the sun. Distances, speeds, relative positions to scale; date constantly displayed. You may start at any date and run forwards or backwards at any speed. Can be used to study morning and evening stars, oppositions, conjunctions, even astrology. Check out the Jupiter Effect! No knowledge of astronomy necessary. Available on disk for Apple II/II+ 32k, DOS 3.2 or 3.3. \$15.00. RK SOFTWARE, 1012 Shamrock, Little Rock, AR 72207.

ADVERTISERS INDEX

Circle No.	Page No.	Circle No.	Page No.
32	Aardvark Technical Services.....95	104	M.B. Rowe & Associate.....160
18	Addison-Wesley Publishing Co....56		Media Mix.....149
63	Advance Access Group.....136	40	Micro-Age Computer Stores.....46
41	Advanced Operating Systems.....103	94	Micro Applications Group.....157
46	Amdek Corp.....108	65	Micro Business World, Inc.....137
103	American Computer Exchange.....160		Micro Con Software Centers, Inc.153
78	Anadex.....120,121	37	Micro Craft Systems.....102
86	ASAP Computer Products.....128	95	MicroLab.....159
97	Aspen Ribbons, Inc.....160	99	Micro Learningware.....160
7	Axiom.....13	58	Micro Management Systems Inc.126
96	Barreto Associates, Inc.....160	84	Micromate Electronics, Inc.....131
26	BASF Systems Corp.....79	33	MicroPro International.....80
54	Beagle Bros.....119	34	Micro-Sci.....52
122	Centronics.....65	9	Microsoft Consumer Products.....17
88	Chang Labs.....45	23	MICROTEK.....68
90	Charles Mann & Associates.....152	75	MISOSYS.....124
68	CLOAD Magazine, Inc.....94	61	Morgan Products, Inc.....134
80	ComData Systems.....146	2	Mountain Computers.....1
108	Commodore International.....C-4	29,38	Muse Software.....110,133
43	Communications Electronics.....104	1	NEC America, Inc.....C-2
83	COMPUMAX.....138		NRI Schools.....63
4	CompuServe.....6	62	Okidata.....135
85	Computer Advanced Ideas.....138	74	Omega Sales Co.....149
70	Computer Discount of America.....141	87	Orange Micro, Inc.....143
67	Computer Information Exchange.....140	14	Osborne Computer Corporation.....37
93	Consumer Computers.....155	100	Pacific Exchanges.....160
8	Corvus Systems.....14	36	Peelings II.....101
52	Covercraft Corp.....117	72	Program Design.....142
81	CPU Shop.....147	92	Programmer's Institute.....154
	Cybernetics.....98	25,28	Qantex/Div. North Atlantic Industries, Inc.....77,87
42	DFS Computer Forms.....105	19	Radio Shack.....59
56	Datasouth Computer Corp.....20	115	RCA Corporation.....114
20	Designer Software.....127	77	Riverbank Software.....144
35	Dilithium Press.....99	10	Select Information Systems.....31
109	Dow Jones.....151	113	Sensible Software, Inc.....86
71	Dymarc Industries.....142	79	Simutek Computer Products.....145
17	Edu-Ware Services, Inc.....55	64	Small Business Computer Systems136
12	Epson America, Inc.....32	22	Software Publishing Corporation.....26
60,106	Hayden Book Co., Inc.....132,161		Source Telecomputing Corp.....67
24	Hayes MicroComputer Products Inc.....75	49,50	SSM Microcomputer Corp.....113,115
55	Heath Company.....123	11	Statcom Corp.....25
5	Hewlett-Packard.....9	47	Structured Systems Group.....41
6,57	Howard Software Services.....11,130		Systems Plus.....96
3	IBM.....4	51	Target Software.....82,83
31	InnoSys.....93	53	Tarbell Electronics.....118
27	Jini Micro Systems.....85	102	T.H.E.S.I.S.....160
69	Konan Corporation.....122	76	TransNet Corporation.....144
107	Leading Edge Products, Inc.....C-3	21	Verbatim, Inc.....60
	Learn, Inc.....66	89	Vertical Data Systems.....152
48,66	Lifeboat Associates.....111,139	13	Videx.....50
15	Lobo Drives, International.....116	16	Vista Computer.....49
30	Logical Systems.....90	44,45	Wesper Microsystems.....106,107
98	Magnolia Microsystems.....160		Westico, Inc.....100,125
73	Mannfred Electronics.....146	101	Xcel.....160

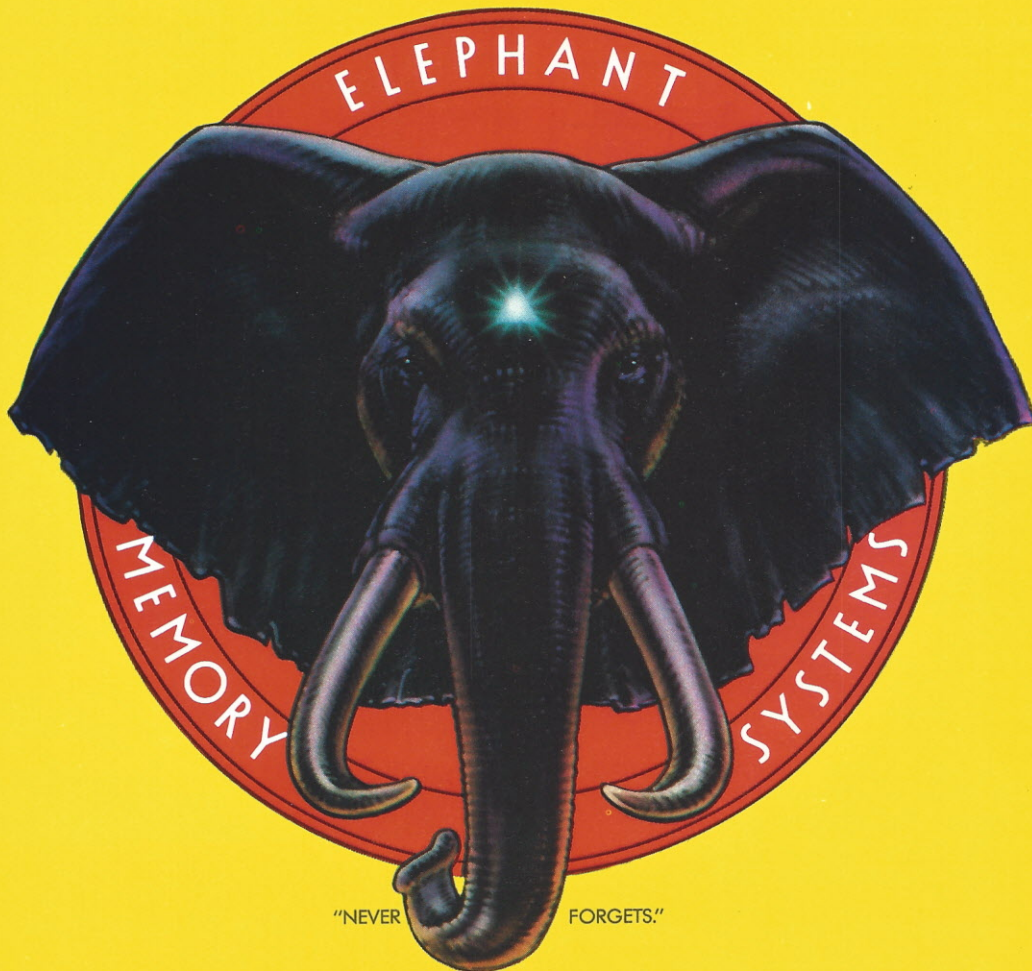
More information can be obtained by circling the Reader Service Number or by contacting your local dealers, listed on page 162.

General Store Section Subscriber Copies Only

Advanced Computer Products.....90-4,90-5	MED Systems.....90-10
American Square Computers.....90-3	Palomar Computer Products.....90-6
ASAP Computer Products.....90-11	Pan American Electronics.....90-10
BT Enterprises.....90-14	Perry Gas & Oil.....90-7
Bonita Computer Software.....90-7	Professional Office Data Management.....90-10
Computer Mail Order.....90-15	Spectrum Software.....90-16
Dynacomp.....90-8,90-9	Synapse Video.....90-14
Hayden Book Company.....90-14	The Information People.....90-12
Jade Computer Products.....90-2	VR Data.....90-13
Master Electronics.....90-7	

Phone or write advertisers for further information.

REMEMBER.



Elephant™ floppies. They're guaranteed to meet or beat every industry standard for quality. They come standard with reinforced hub rings at no extra cost. They come in every popular 5¼" model, in both hard and

soft sector. And they sell at some of the lowest prices in the business. Elephant Flexible Disks. They're heavy duty. They work for peanuts. They never forget. Get yourself a trunkful.

HEAVY DUTY DISKS.

Distributed Exclusively by Leading Edge Products, Inc., 225 Turnpike Street, Canton, Massachusetts 02021
Call: toll-free 1-800-343-6833; or in Massachusetts call collect (617) 828-8150. Telex 951-624.

THE COMMODORE COMPUTERS

"FROM \$300 TO \$1995, THEY COST LESS AND GIVE YOU MORE FOR YOUR MONEY. READ OUR CHART."

— William Shatner

The idea of a computer in every office and home used to be science fiction. Now it's becoming a reality. The question is, with so many to choose from, which computer should you buy? When you consider the facts, the clear choice is Commodore.

COMPARE OUR \$995 COMPUTER.

FEATURES	COMMODORE 4016	APPLE II	IBM
Base Price	\$995	\$1,330	\$1,565
12" Green Screen	Standard	299	345
IEEE Interface	Standard	300	NO
TOTAL	\$995	\$1,929	\$1,910
Upper & Lower Case Letters	Standard	NO	Standard
Separate Numeric Key Pad	Standard	NO	Standard
Intelligent Peripherals	Standard	NO	NO
Real Time Clock	Standard	NO	NO
Maximum 5½" Disk Capacity per Drive	500K	143K	160K

Prices are as of the most recent published price lists, September, 1981 and approximate the capabilities of the (16K) PET® 4016. Disk Drives and Printers are not included in prices. Models shown vary in their degree of expandability.

Many experts rate Commodore Computers as the best desk-top computers in their class. They provide more storage power — up to 1,000,000 characters on 5¼" dual disks — than any systems in their price range. Most come with a built-in green display screen. With comparable systems, the screen is an added expense. Our systems are more affordable. One reason: we make our own microprocessors. Many competitors use ours. And the compatibility of peripherals and basic programs lets you easily expand your system as your requirements grow. Which helps explain why Commodore is already the No. 1 desk-top computer in Europe with more than a quarter of a million computers sold worldwide.



WE WROTE THE BOOK ON SOFTWARE.

The Commodore Software Encyclopedia is a comprehensive directory of over 500 programs for business, education, recreation and personal use. Pick up a copy at your local Commodore dealer.

FULL SERVICE, FULL SUPPORT.

Commodore dealers throughout the country offer you prompt local service. In addition, our new national service contract with TRW provides nationwide support. Visit your Commodore dealer today for a hands-on demonstration.



Commodore Computer Systems
681 Moore Road
King of Prussia, PA 19406

Canadian Residents:
Commodore Computer Systems
3370 Pharmacy Avenue
Aincourt, Ontario, Canada, M1W 2K4

CBM-PC



commodore
COMPUTER
CIRCLE 108